

JPRS 71499

18 July 1978

TRANSLATIONS ON TELECOMMUNICATIONS POLICY,  
RESEARCH AND DEVELOPMENT  
No. 46

**DISTRIBUTION STATEMENT A**  
Approved for Public Release  
Distribution Unlimited

Reproduced From  
Best Available Copy

20000503 048

**U. S. JOINT PUBLICATIONS RESEARCH SERVICE**

REPRODUCED BY  
NATIONAL TECHNICAL  
INFORMATION SERVICE  
U. S. DEPARTMENT OF COMMERCE  
SPRINGFIELD, VA. 22161

**WORLD**

**WIDE**

#### NOTE

JPRS publications contain information primarily from foreign newspapers, periodicals and books, but also from news agency transmissions and broadcasts. Materials from foreign-language sources are translated; those from English-language sources are transcribed or reprinted, with the original phrasing and other characteristics retained.

Headlines, editorial reports, and material enclosed in brackets [] are supplied by JPRS. Processing indicators such as [Text] or [Excerpt] in the first line of each item, or following the last line of a brief, indicate how the original information was processed. Where no processing indicator is given, the information was summarized or extracted.

Unfamiliar names rendered phonetically or transliterated are enclosed in parentheses. Words or names preceded by a question mark and enclosed in parentheses were not clear in the original but have been supplied as appropriate in context. Other unattributed parenthetical notes within the body of an item originate with the source. Times within items are as given by source.

The contents of this publication in no way represent the policies, views or attitudes of the U.S. Government.

#### PROCUREMENT OF PUBLICATIONS

JPRS publications may be ordered from the National Technical Information Service, Springfield, Virginia 22151. In ordering, it is recommended that the JPRS number, title, date and author, if applicable, of publication be cited.

Current JPRS publications are announced in Government Reports Announcements issued semi-monthly by the National Technical Information Service, and are listed in the Monthly Catalog of U.S. Government Publications issued by the Superintendent of Documents, U.S. Government Printing Office, Washington, D.C. 20402.

Indexes to this report (by keyword, author, personal names, title and series) are available through Bell & Howell, Old Mansfield Road, Wooster, Ohio, 44691.

Correspondence pertaining to matters other than procurement may be addressed to Joint Publications Research Service, 1000 North Glebe Road, Arlington, Virginia 22201.

#### REMINDER

Information on worldwide political, economic and technical developments in telecommunications, computers, and satellite communications appears in TRANSLATIONS ON TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT.

Information on environmental pollution and pollution control technology, organizations and programs appears in TRANSLATIONS ON ENVIRONMENTAL QUALITY.

Information on Law of the Sea conferences and negotiations, territorial seas and straits, coastal and international seabed economic areas, marine pollution, scientific research and fisheries appears in TRANSLATIONS ON LAW OF THE SEA.

Information on incidence, outbreak and other aspects of human, animal, and plant diseases, insect pests and control, sanitation conditions, immunization and public health programs appears in WORLD EPIDEMIOLOGY REVIEW.

<b>BIBLIOGRAPHIC DATA SHEET</b>		1. Report No. JPRS 71499	2.	3. Recipient's Accession No.	
4. Title and Subtitle TRANSLATIONS ON TELECOMMUNICATIONS POLICY, RESEARCH AND DEVELOPMENT, No. 46				5. Report Date 18 July 1978	
7. Author(s)				8. Performing Organization Rept. No.	
9. Performing Organization Name and Address Joint Publications Research Service 1000 North Glebe Road Arlington, Virginia 22201				10. Project/Task/Work Unit No.	
				11. Contract/Grant No.	
12. Sponsoring Organization Name and Address  As above				13. Type of Report & Period Covered	
				14.	
15. Supplementary Notes					
16. Abstracts  This serial report contains translations from the world press and radio relating to worldwide political, economic and technical developments in telecommunications, computers, and satellite communications. Coverage will be worldwide with focus on France, Federal Republic of Germany, United Kingdom, Italy, Japan, the USSR, People's Republic of China, Sweden, and the Netherlands.					
17. Key Words and Document Analysis. 17a. Descriptors  Worldwide Computers Satellite Communications Electronics and Electrical Engineering Telecommunications Telemetry					
17b. Identifiers/Open-Ended Terms					
17c. COSATI Field/Group 09B, C, F, 17B, 22B					
18. Availability Statement Unlimited Availability Sold by NTIS Springfield, Virginia 22151				19. Security Class (This Report) UNCLASSIFIED	
				20. Security Class (This Page) UNCLASSIFIED	
				21. No. of Pages 69	
				22. Price PC A04	

18 July 1978

TRANSLATIONS ON TELECOMMUNICATIONS POLICY,  
RESEARCH AND DEVELOPMENT

No. 46

## CONTENTS

PAGE

## ASIA

## INDONESIA

- Earth Station Built Without Foreign Assistance  
(KOMPAS, 28 Apr 78)..... 1

## PEOPLES' REPUBLIC OF CHINA

- Briefs  
New Kwangtung TV Transmitter 4

## EASTERN EUROPE

## BULGARIA

- Measuring Telecommunications Devices Outdated, Ineffective  
(Gavril Aleksiev; IMPULS, 6 Jun 78)..... 5

## LATIN AMERICA

## BRAZIL

- Stored Data Systems To Be Installed  
(Various sources, various dates)..... 8
- National Control Guaranteed  
New System Announced
- Government Emphasizes Development of Software Program  
(O GLOBO, 15 Jun 78)..... 10
- CAPRE Postpones Decision on Computer Imports Again  
(O ESTADO DE SAO PAULO, 16 Jun 78)..... 12

CONTENTS (Continued)	Page
National Company To Begin Building Minicomputers (JORNAL DO BRASIL, 5 Jun 78).....	13
Fujitsu Transfers Minicomputer Technology to EDISA (JORNAL DO BRASIL, 8 Jun 78).....	16
Briefs Microwave System	17
CUBA	
Telecommunications Day Marked in Havana: Quality Sought (Roberto Gili; GRANMA, 18 Mar 78).....	18
NEAR EAST AND NORTH AFRICA	
INTER-ARAB AFFAIRS	
Telecommunications Explosion (T. Bjorn Lundvall Interview; EVENTS, 30 Jun 78).....	20
ALGERIA	
Telecommunications, TV Relay Being Extended to Rural Areas (Rabah Berrabah; EL MOUDJAHID, 1 Jun 78).....	22
Beninese To Be Trained at Oran Telecommunications Institute (EL MOUDJAHID, 30 Apr 78).....	24
LEBANON	
Telecommunications Agreement Concluded With France (L'ORIENT-LE JOUR, 9 Jun 78).....	26
WESTERN EUROPE	
FRANCE	
U.S. Market Goal of Fast-Growing Jeumont-Schneider (Helene Pichenot; L'USINE NOUVELLE, 22 Jun 78).....	27
Hope Still Seen for Nation's Telecom Export Position (Helene Pichenot; L'USINE NOUVELLE, 15 Jun 78).....	29

CONTENTS (Continued)	Page
CNES, TDF Plan Television Broadcast Satellite (D. Levy; ELECTRONIQUE ACTUALITES, 19 May 78).....	32
ITALY	
Two-Dimensional Digital Filters for Image Processing (L. Delcaro, G. Sicuranza; ALTA FREQUENZA, Feb 78)...	35
WEST GERMANY	
Modern Data Processing Systems Threaten Privacy, Freedom (Horst Bieber; DIE ZEIT, 5 May 78).....	46

## INDONESIA

### EARTH STATION BUILT WITHOUT FOREIGN ASSISTANCE

Jakarta KOMPAS in Indonesian 28 Apr 78 pp 1, 12

[Article: "Domestic Construction of Earth Station"]

[Text] An earth station as large as the Palapa SKSD [Domestic Satellite Communication System] Station at Cibinong has been built by LAPAN [National Flight and Space Foundation] at Ranca Bungur, Bogor. The antenna is 8 meters high and has a diameter of 10.3 meters. While the Cibinong station was bought from abroad, the Ranca Bungur station was constructed entirely by Indonesian technicians. LAPAN experts under the direction of Engineer E. Yamin performed all planning and construction.

The Ranca Bungur earth station is aimed at the Palapa satellite positioned at 80 degrees east longitude, approximately over Sri Lanka. The Ranca Bungur station has been able to communicate with the Palapa satellite during testing.

The antenna was constructed according to international specifications, while part of the electronics is a prototype of SKSD equipment.

Testing has included determination of the sensitivity of the entire receiving system and measurement of the antenna's radiation pattern. Studies also have been made of the effect of rain on microwave transmissions originating from the Palapa satellite.

The Ranca Bungur station, which weights 8 tons, is the first large earth station to be built in its entirety by Indonesians. Engineer Mahdi, a staff member of the LAPAN Space Telediffusion and Communications Project, said that experience in building the earth station shows that many components are obtainable domestically and are the same as SKSD components.

Research connected with the earth station will benefit educational television. Determination of the number of people needed and of accurate antenna angles will be useful in the development of educational television facilities planned by the government. This equipment will also enable studies of communications via satellite between points on earth.

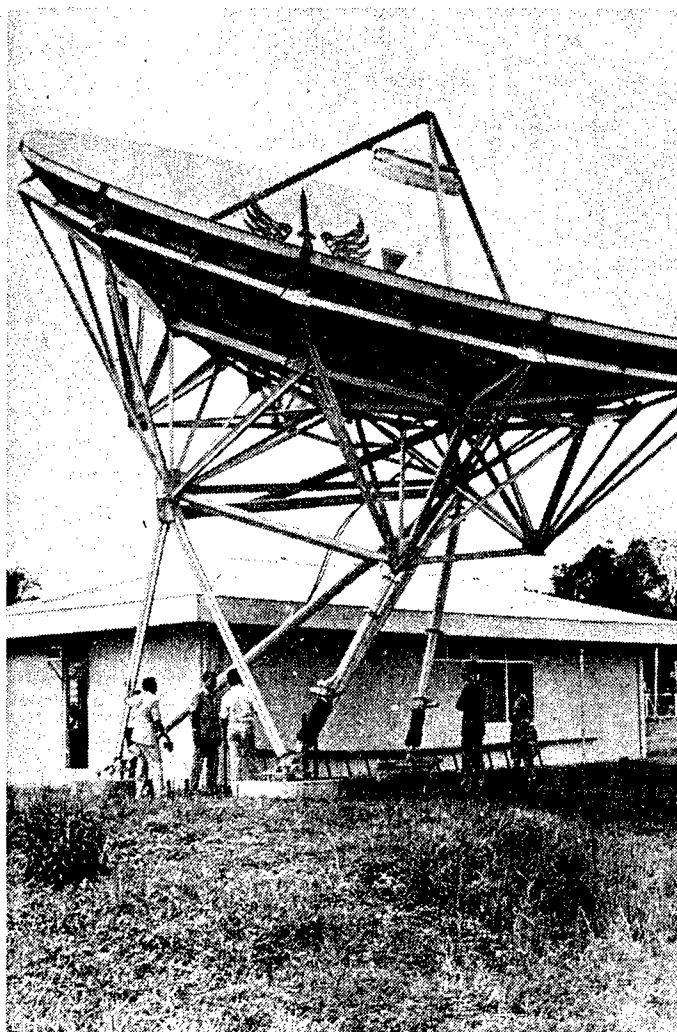


Both the hardware and software of the station are very important to us, according to Engineer Bambang Tjahjono, a member of the station's staff. Furthermore, he said, developed countries such as the United States and Japan are now providing only limited scholarships for the advanced training of our specialists. Available scholarships are mostly for short courses, congresses and seminars. They have begun to close the door to scholarships for more extensive training.

Beginning in May, test communications are to be made with the experimental European satellite, "Symphony." Approval has been given by West Germany, which owns the satellite, with the provision that there will be no commercial use of it. The elevation of the Ranca Bungur antenna will be lowered from 60 degrees (aimed at the Palapa satellite) to the 25 degrees required for communications with the Symphony satellite, which will be positioned at an altitude of 36,000 kilometers geosynchronously (i.e., the satellite appears motionless because its orbital speed is the same as the rotation of the earth at the equator).

Engineer Bambang Tjahjono pointed out personnel problems to three members of the DPR [parliament] Commission X who visited the station on 27 April. Most specialists, especially the electrical engineers needed for research on the station project, prefer to work for private companies because of the higher salaries offered. Government incentive allowances for research personnel have not yet been put into effect, and no housing has been provided for engineers working at the Ranca Bungur station.

The LAPAN telediffusion project, which includes the earth station, was begun in 1974. The first 2 years were used in establishing direction through attending seminars and congresses. Construction of the Ranca Bungur station was begun in early 1977 and was completed in only 2 months. The telediffusion project now has a staff of 15 engineers, 25 technicians/operators, and 10 administrative workers.



Ranca Bungur Earth Station

6942  
CS0: 5500

PEOPLE'S REPUBLIC OF CHINA

BRIEFS

NEW KWANGTUNG TV TRANSMITTER--The east Kwangtung television relay transmission station situated in the (Hungtu) mountains in (Hsiapahsiang) commune in Fengshun county has been successfully completed and has begun test transmissions. The Kwangtung broadcasting management bureau decided to build the east Kwangtung television relay transmission station in order to cope with the needs of the developing situation. The Meihsien prefectoral CCP Committee and the Fengshun county CCP Committee attached great importance to the project and vigorously supported it with manpower and materials. The project was begun in the winter 1975. Despite severe cold and heat, all the staff members of the project's headquarters and of the television relay transmission station and about 1,000 laborers from 9 communes in Fengshun county struggled in the (Hungtu) mountains 1,200 meters above sea-level. The project was completed after 2 years of efforts. Various localities in east Kwangtung will now have better reception of television relay transmissions. [Canton Kwangtung Provincial Service in Mandarin 0430 GMT 3 Jul 78 HK]

CSO: 5500

BULGARIA

MEASURING TELECOMMUNICATIONS DEVICES OUTDATED, INEFFECTIVE

Sofia IMPULS in Bulgarian 6 Jun 78 p 3

[Article by Gavril Aleksiev: "Good Managers Are Needed"]

[Text] By Order No 671 of 26 August 1971 of the first deputy minister of communications, a commission was appointed which was to make a check on metering equipment, their management, use and technical state. Four central okrug communications administrations were inspected in Varna, Ruse, Plovdiv and Veliko Turnovo. Checks were also made at the Radio and Television Enterprise with its affiliates and at the divisions of the entire nation, and at the Communications Industrial and Repair Enterprise in Ruse. In Sofia, a check was made at the Communications Scientific Research Institute, the Telekomplekt ISO [?Engineering Organization for Complete Telecommunications Equipment] and the Sofia telephone and telegraph offices.

The checks in the okrug communications administrations did not produce comforting results. The poor management was due mainly to poor conditions. The absence of repair specialists has led to the presence of many damaged metering devices.

A larger portion of the metering equipment for years running has not undergone a state or departmental inspection. It is interesting that the sectorial directorates of the State Standardization Committee have not demanded a declaration or inspection of the equipment. Some 90 percent of the metering equipment has had the seals broken for various reasons. And some even were not factory sealed. A larger portion had been repaired or an attempt had been made to repair them. But for this it is essential to have original spare parts and elements, servicing specifications, but these usually are lacking. If we add the poor skills, the picture will become clear. Thus, the metering devices, instead of being in working order, are further damaged and become completely unfit for use. There is only a small percentage of successful attempts.

Unfortunately there is a great deal of obsolete and technically old metering equipment in use. This has been used for decades without knowing its technical state. Even the new equipment is not always well understood. Due to careless handling it frequently breaks down and stands unused for years.

Transportation also has a strong influence. Ordinary motor vehicles are used to transport the equipment, and the vehicles lack elementary accessories. No one has given any thought even to creating special packaging. An exception is the radio relay station in Plovdiv and here they have made special cases for transporting articles.

At none of the inspected places was there an assigned specialist who was responsible only for the metering system, with this being his basic task, and other obligations would be secondary. There are also paradoxes. At the Plovdiv OUS [okrug communications administration], the manager of the administration (a person who did not know a single instrument and did not have an elementary technical education) was responsible for the metering equipment. Here they have the most metering equipment. In the cable system, it has been damaged exclusively by poor transport. It is transported in trucks which are used to carry cables and connectors, without any elementary protective facilities. The leaders of the system feel that they must import a special vehicle or they must make cases. They do not wish to study the experience of their comrades from the radio relay station in their city.

Only at the NIIS [Scientific Research Institute for Communications] is there an established departmental metrological service established by the bodies of the State Standardization Committee, with permits for repairs and inspection. The laboratory has the right to certify newly produced and newly developed metering systems for the needs of the department.

However, the situation is not the same at the Telekomplekt ISO. At the Central Installation Administration, an annual inventory had not been made. The technical state was unknown. Some of the equipment was at installations, without being shown anywhere. No person had been assigned who would be responsible for the metering system, and there was no card file or specifications. The picture was not much different in the engineering-construction and installation administration. There was a purchased metering vehicle for low-current measurements, but this was not being used for its proper purpose. (And it cost the department around 35,000 leva.) The vehicle was merely being used as a conveyance. As a bad example one might also point to the case of the metering vehicle purchased for 36,500 leva. Afterwards it was established that the equipment was not required, it was removed from the vehicle, abandoned in a barracks, and the vehicle became an ordinary conveyance.

In the installation and operating of the nation's radio relay system, a special Reflectomat meter was purchased at a cost of 45,000 leva. After it had been damaged, it was sent back to West Germany for repairs, it was repaired, it was again damaged and abandoned. The new 45,000 leva have been frozen for a long period of time.

At the Sofia Telephone and Telegraph Station the picture also does not inspire optimism. Here the metrological service exists formally, diaries are not kept, repair work is not shown in any document and there are no exemplary metering systems.

And we know how much money the ministry spends on metering systems and how much the quality of Bulgarian communications depends on them.

What must be done?

In the first place, the entire metering system must be made known, in introducing standard specifications, in reallocating equipment which is unneeded at one place to where it is needed, to take all unsuitable or obsolete equipment out of use, and to eliminate damaged equipment.

Another rapid measure by which the first steps can be made is to create a strong metrological service base. Order No 93 of 9 February 1978 marked the beginning to establishing such a service. But zoned as they are, they cannot cover all the divisions of the department. Under the Central Laboratory for Departmental Metrological Inspection an additional repair service must be set up. If this central laboratory will be enlarged by another four-five specialists, it will assume repairs on the metering systems from the first direction for Western Bulgaria with the okrugs of Sofia City, Sofia, Botevgrad, Pernik, Kyustendil, Vratsa, Mikhaylovgrad and Vidin.

It is not economically advisable to transport a metering instrument from Vidin and Bratsa okrug to Veliko Turnovo. By analogy Botevgrad and Kyustendil okrugs must be compared with the service facility in Plovdiv where the devices must travel several hundred kilometers for repair. When it is damaged, no consideration is given to the quality of transport. But special transport must be provided for a repaired expensive and complex device. A vehicle cannot be equipped for each okrug. This would be a waste of money and time.

It must be realized that the established service facilities without specifications, spare parts and well trained personnel should not be allowed to exist.

Since we have started this work, let it be carried out completely.

10272

CSO: 5500

BRAZIL

## STORED DATA SYSTEMS TO BE INSTALLED

### National Control Guaranteed

Rio de Janeiro JORNAL DO BRASIL in Portuguese 15 Jun 78 p 16

[Text] Brasilia--Minister of Communications Euclides Quandt de Oliveira guaranteed yesterday that the manufacture of components for the installation of Stored Data Telephone Centers (CPA) will remain under national control through Transit, a factory installed in Montes Claros, Minas Gerais, which holds the technology in the sector.

The intention of the Ministry of Communications, with the support of the Ministry of Industry and Commerce, the Ministry of Planning and the National Development Bank, is that of consolidating this company in the national market. Thus, if a foreign company becomes active in the nation, it must also absorb national technology, even if it is among those bidding for the installation of centrals.

### Deadlines

Minister Quandt de Oliveira reported that the selection of the companies responsible for the installation in the country of the first centrals have a period limited to 30 days, the time period given to Ericsson and the Atlantica de Seguros Group, to discuss the additional requirements for the bidding imposed by the Ministry for making its final decision as to the winners.

He denied that the deadline had the objective of causing alternative solutions for the installation of the CPA in the country, such as obliging the bidding companies--Ericsson, ITT and NEC--to become partners. "It is not very likely that a partnership of that type will take place because the technology of the companies is different as are their proposals," said the minister.

### New System Announced

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 5 Jun 78 p 11

[Text] By 1981 the first 50 telephone lines for the CPA (Stored Data Centrals) will be installed in Sao Paulo. The information was provided by Minister of Communications Euclides Quandt de Oliveira, who also said that he has decided that within 30 days the Brazilian Telecommunications Corporation [TELEBRAS] will have finished drafting the adaptation requirements for the installation of the system by the firms winning the bids at public auction held by the ministry.

According to the minister, practically all the proposals presented have many identical points, selection having been made primarily on the basis of the share of national capital in the company to be created, decision making control to remain in Brazilian hands, and on the proposed bases for the transfer of technology. In the bid auction, no levels required for the three items were established, it being up to the bidders to present their suggestions, including on the share of national capital. The six bidders having presented "rates of national participation of over 51 percent," the minister decided to retain this limit as mandatory for the creation of the companies which intend to operate in the sector. In this first phase of the installation of the CPA system, the Ericsson Company in partnership with Atlantica Companhia Nacional de Seguros, will have priority in forming the new company. In case it does not meet the requirements of TELEBRAS, the winner will be the company which placed second in the bidding, the International Standard Electric Corporation--ISEC--which will partner up with one of the national groups for that purpose.

In principle the requirements of adaptation should depend on the requirement for an effective participation of Brazilian capital; the certainty that the process of transfer of technology is going to happen within an ideal period, 3 years in principle, and on the effective decision making participation by the Brazilian part.

8908

CSO: 5500



## BRAZIL

### GOVERNMENT EMPHASIZES DEVELOPMENT OF SOFTWARE PROGRAM

Rio de Janeiro O GLOBO in Portuguese 15 Jun 78 p 21

[Text] The government will create a special line for financing research and development of national "software" (computer programing and analysis). This information was provided by the executive secretary of the Electronic Data Processing Activities Coordinating Commission [CAPRE], Ricardo Saur at the First Meeting on Software for National Minicomputers which closed yesterday in Rio.

The extension of financing to the software companies should be part of the arsenal of measures for the implementation of the national data processing plan prepared by CAPRE.

"The definition of the rules of the game for the software market should be made quickly, perhaps even before the end of the Geisel administration." That is the opinion of Saur, who emphasized the need to guarantee the market to national companies during the meeting, which for the first time gathered together the four manufacturers of national minicomputers (Labo, Ediso, SID and Cobra), and more than 50 software manufacturers and minor services. According to the CAPRE secretary, the action of the agency should be in keeping with the position assumed for the production of minicomputers through the reservation of the market for machinery (hardware) manufacturers with a real transfer of technology. "If we made such a great effort for hardware, it is obvious that we are going to do the same thing for software," said Saur. "We are trying to prevent the entry of multinational companies into the market even through the back door of minor services."

#### Expensive Development

The financing of software production was one of the most repeated demands by the manufacturers during the meeting. They argue that its development is expensive and takes a long time, therefore, it is difficult for the companies of the sector which generally are of small size with respect to capital. They say: "Our greatest possession is of an intellectual nature it is the know-how already achieved. That is why we cannot provide the guarantees normally requested by the financing agencies. We need mechanisms of a new type."

The position of the software manufacturers was supported by the representative of the FINEP [Corporation for Financing Studies and Projects], Manoel Louzada. Participating at the side of CAPRE in the final panel of the meeting, Louzada proposed a number of measures on financing for the area of software. In addition to the line of financing already mentioned, for which the FINEP should be the agency assigned to distribute resources, Louzada believed viable the creation of a specific Nucleus for the Articulation of the Industry (NAI) for the software sector. Through that measure, the state companies would give priority to the purchase of national programs. Louzada also said that because software began to be considered an industrial product, the manufacturers can benefit from the more advantageous conditions in obtaining capital, since the technological independence of the sector is a priority matter and without the effort undertaken up to now, it could be endangered. The FINEP representative emphasized the change noted in the position of the agency, since up to now financing was granted only to consulting companies under less favorable conditions with respect to interests and terms of need.

8908

CSO: 5500

BRAZIL

# CAPRE POSTPONES DECISION ON COMPUTER IMPORTS AGAIN

Sao Paulo O ESTADO DE SAO PAULO in Portuguese 16 Jun 78 p 27

[Text] Although it has completed all studies on the technical level, the Electronic Data Processing Activities Coordinating Commission [CAPRE] yesterday postponed anew the decision on a request from IBM to import 400 computers of the 32 type, whose manufacture in the country was authorized for only four companies, among them COBRA [Brazilian Computers Inc.] a state company.

Technical studies counsel that the IBM request be analyzed carefully so as not to harm the principles of merit established for such imports. This means that the relative merit, in terms of the ceiling established for foreign purchases of electronic devices in the amount of \$130 million, be taken into consideration in addition to the intrinsic factor of the validity of the project.

Thus, it is not very probable that the IBM request will be approved even if only the technical analysis is taken into consideration. This is because of the total imports allowed in dollars, only \$30 million are normally destined for an increase in the volume of equipment or for the purchase of new electronic devices. Of the remaining \$100 million, \$85 million are applied to projects of manufacturing in the country (purchase of technology for the sector, for example) and \$15 million to the purchase of spare parts for equipment already operating.

A CAPRE member explained at the end of the meeting yesterday that it is not a matter of any restrictive measure against attempts to import the M-32 computers by IBM, since the company itself is responsible for large purchases of apparatus abroad within the established limits. "It is merely compliance with the merit system which is used for all purchases."

In yesterday's meeting, CAPRE approved a plan named "Dirigide," which is intended for installing a data distribution process in the financial area and the banking system for servicing small banks which do not need a national system which is so technically advanced.

## BRAZIL

### NATIONAL COMPANY TO BEGIN BUILDING MINICOMPUTERS

Rio de Janeiro JORNAL DO BRASIL in Portuguese 5 Jun 78 p 3

[Text] Sao Paulo--The plan for producing minicomputers by Labo-Eletronica Ltd., a company with totally national capital and belonging to the Ferragens e Laminacao Brasil S.A., a holding company for the Forsa Group, foresees the delivery of the first piece of equipment to the Brazilian market around the end of the third quarter of this year, probably in September, according to the director of the Forsa Group and Labor, Ernest Muhr: "The market is going to prove to be much greater than it is imagined today. There is going to be a data explosion."

Total investments in that project are on the order of 500 million cruzeiros, while Labo-Eletronica will begin the first year of operations with 150 million cruzeiros, which is its own capital. Labo will have 75 percent of the stock in the undertaking and the rest will be distributed between Digibras (15 percent) and Brasilinvest (10 percent) [both expansions unknown].

#### Entry Into Data Processing

The Labo project and its selection by CAPRE--Electronic Data Processing Activities Coordinating Commission---for the creation of the minicomputer industry in the country together with the state company COBRA [Brazilian Computers Inc.], EDISA [expansion unknown], and the Sid Group (Sharp, Inepar, Dataserv and Digibras), is explained by Ernest Muhr: "Labo was a supplier of components for telecommunications but with the cutback in investments in the sector by the government, it had to go out to seek new things to make. Becoming part of the Forsa Group, it began to be sought out by foreign firms, which wanted to provide it with their technology and even form "joint ventures." This took place in the past 2 years. In that period, the manufacturers of data processing equipment wanted a national partner but there was a lack of definition of government policy for the sector.

He also recalls that with the opening of bids for the production of mini-computers "through Brazilinvest I made contact with Nixdorf, a company which would provide us with technology and is considered to be the most advanced technically on the world scene. Since we fulfilled the requirements demanded by CAPRE, we were selected." Ernest Muhr made it a point to list the reasons he considered fundamental for the approval of the Labo Project: a) total national capital; b) the partner which controls the group (Ferragens e Laminacao Brasil S.A.) has a broad industrial experience with "35 years of proved success;" c) the Labo tradition of quality in professional electronic equipment; d) the share of the Forsa group, which allows the exercise of an overall responsibility, and in addition the participation of Brazilinvest with its financial backing "added to that which the group already has;" and e) the quality of the project presented, its technological level, and its processing capability.

#### A Fourth of the Market

Ernest Muhr reported that a market survey made by Digibras foresees the growth of the national component industry and the share of Labo Electronics in the production of minicomputers will be on the order of one-fourth of the total.

"We shall manufacture the largest minicomputers in Brazil which may be used in the area of medium-size firms (not the small ones yet) which still do part of their bureaucratic work through processing in bureaus, and in the large companies which have a network of branch offices as in the case of the banks," explains Ernest Muhr.

Labo General Manager, Rudolf Oehling, adds that the estimated market for the first 5 years will be satisfied by his company as follows: "We are scheduling a production of 100 pieces of equipment in 1978, 350 in 1979, 460 in 1980, 560 in 1981, and 640 in 1982. That makes 2,300 to 2,400 minicomputers of a foreseen total of 10,000 units which the industry will have to produce."

As far as the cost of the Labo minicomputer, which will be broadly modular, is concerned, it will vary from \$90,000 (1,530,000 cruzeiros) for the small ones, to \$400,000 (6.8 million cruzeiros) for the larger ones.

#### Scheduled Goals

With respect to the national production of his minicomputer, Ernest Muhr explained that "during the 5 years of contracts with the Nixdorf Company, we received technology for the minicomputers and also for components. It is possible that not everything will be nationally built in this time period.

I remember that the automobile industry, now 23-years-old, still has items which are not nationally produced. We should never expect 100-percent national production in the sector. However, we have a progressive plan in that respect in addition to the technical adaptations which shall be made to suit Brazilian needs."

"There will be successive increases in nationally built content: first through manpower and later by the inclusion of nationally built components. The simple fact of final installation and the testing of the equipment in Brazil is already a 50-percent national share in the cost of the final product. That means that there will be a saving in foreign credits of 50 percent, which we consider very important in only the first year of production. In the second year, we shall reach 70 percent, and 85 percent in the third. Our practical limit is 90 percent but to achieve those goals the collaboration of the component industry will be necessary," he commented. Ernest Muhr believes that "if the market really develops we shall see growth rates in the computer sector which will far exceed those seen traditionally. That is why there were so many bidders in the CAPRE auction for bids." In his opinion "the Brazilian economy has grown much faster than its population. And there was no technological training for the administration of the economy. Moreover, the size of Brazil by itself is such that commercial and industrial operations can no longer be administered with a pencil and an eraser. Or with beans as they say. The computer has become an instrument without which work cannot be done." On the export of minicomputers, Ernest Muhr said that in the first year of production some 12 to 15 units will be destined for the foreign market, there being prospects of supplying the Latin American market primarily. The Nixdorf company has a branch office in Venezuela to facilitate sales.

#### Technical Data

The general manager of Labo, Rudolf Oehlin, said that the main technical characteristics of the minicomputer are: main memory bank is of 64 to 128 kbytes, auxiliary memory of removable disks is of 10 to 40 mbytes, needle printer of 150 characters per second, line printer of 300 lines per minute, and magnetic tape of 800 to 1600 BPI.

8908

CSO: 5500

BRAZIL

FUJITSU TRANSFERS MINICOMPUTER TECHNOLOGY TO EDISA

Rio de Janeiro JORNAL DO BRASIL in Portuguese 8 Jun 78 p 19

[Text] Porto Alegre--The Japanese company, Fujitsu Limited, yesterday signed a contract transferring technology to the Rio Grande do Sul industry, Eletronica Digital S.A.--EDISA, for the manufacture of minicomputers for the domestic market, Africa and the Middle East. The agreement also includes training of personnel and technical assistance.

Paulo Renato Ketzer de Sousa, the director-president of EDISA, said that the company will be installed by the end of March 1979 and will be manufacturing the first lot of 82 units a year later. At the same time that the installation of the factory is being done in the Gravatai Industrial District (30 km from the capital), EDISA will import complete systems for sale on the domestic market from Japan, with delivery foreseen for November of this year.

Production

With the objective of familiarizing the market with the product, complete units will be imported during the first phase. In the second phase, however, EDISA will assemble the metal cabinets here to hold the imported components. In the next phase, the printed circuits, power supplies, and internal wiring, whose components will be acquired in the domestic market, will be manufactured.

The minicomputers will only be 100-percent nationally built as of the third year of the EDISA operation, when production will increase from 82 units per year to 150.

8908

CSO: 5500

BRAZIL

BRIEFS

MICROWAVE SYSTEM--Pernambuco State Governor Moura Cavalcanti today attended a ceremony at which the cities of Ouricuri and Araripina were incorporated into the microwave communications system. [Brasilia Domestic Service in Portuguese 2200 GMT 26 Jun 78 PY]

CSO: 5500



## TELECOMMUNICATIONS DAY MARKED IN HAVANA: QUALITY SOUGHT

Havana GRANMA in Spanish 18 Mar 78 p 3

[Article by Roberto Gili: "Raising the Quality of the Service We Provide the Public Is the Center of Attention in Our Daily Work"]

[Text] On 17 May 1865, 20 countries meeting in France celebrated the first conference of what would later become the International Telecommunications Union, the oldest of all international organizations. Its second meeting, in 1868, was held in Switzerland, in spite of Emperor Napoleon III's efforts to have France be the seat of that institution. At the end of the last century, the union had 38 members and now it is made up of over 150 countries. As a fitting reminder of the date of its establishment, every 17 May, World Telecommunications Day is celebrated.

What is the atmosphere in which this anniversary is celebrated in Cuba?

"Our ministry is celebrating this new World Telecommunications Day involved in multiple tasks," replied engineer Salvador Gutierrez, MINCOM's [Ministry of Communications'] director of telecommunications in our country. "First of all," he added, "I should mention the watchword we have adopted to guide our work: Quality."

The following are some salient parts from the Ministry of Communications' message to its workers on the conclusion of the past year: "The installation of equipment and the construction of media for the microwave system, the National Long Distance Center, radio and television broadcasting, radio connections, telephone stations, telephone and telegraph channels with new links to international communications and thousands of kilometers of route for communications in general, for MINAZ [Ministry of the Sugar Industry] and the railroads in particular, are accomplishments which, together with our industry's production, have come up to the level of the year of the 60th anniversary of the October Revolution.

"All this," said the director of telecommunications, "is a significant increase in the infrastructure currently in use by telecommunications workers to satisfy the needs of the country's economy as well as those of

our people and they demand a continued effort to make the quality of the services we supply through them correspond with what our party and government expect.

"This effort expended in 1977 is continuing in the current year by means of the development plans which the organization has before it, outstanding among which is the beginning of the installation of the coaxial cable which will run the length of the island with a capacity for 1,920 telephone circuits and a television station in both directions. This project, the execution of which will take several years, is the most important one our ministry has undertaken since the triumph of the revolution."

Other tasks being carried out in this important field are those related to the support for the 11th Festival and the Sixth Summit Meeting of Non-aligned Countries which will be held in our country next year, designed--according to Gutierrez--"to guarantee the satisfaction of the national and international telecommunications needs which will arise during these celebrations." Moreover, it should be pointed out that, within the framework of the international solidarity our country subscribes to, the Ministry of Communications maintains a large number of engineers and technicians in Angola and Mozambique collaborating in the maintenance of the communications networks and systems.

"The collaboration from the socialist camp and especially the Soviet Union in the area of communications," Gutierrez concluded, "has been manifested in many ways. The list of material contributions we have received from the USSR goes from the manufacturing of an electronic valve to keep our national network in operation in the first years of the revolution, to this latest project for the coaxial cable we mentioned, passing through the 'Caribe' land station, receiver and television factories and complete communications stations, just to mention the most important ones."

11937  
CSO: 5500

TELECOMMUNICATIONS EXPLOSION

Beirut EVENTS in English 30 Jun 78 p 64

[Interview with T. Björn Lundvall, Chairman of LM Ericsson]

[Text]

*The Arab states have shown great interest in telecommunications, and recently two multi-million dollar deals have been awarded: in the face of heavy competition Philips, and Sweden's LM Ericsson were given a \$4bn contract by Saudi Arabia; and last month the world's largest telecommunications contract, estimated to be worth \$20bn over the next 20 years, was awarded by Egypt to AT and T. Björn Lundvall, Chairman of LM Ericsson discussed the "telecommunications explosion."*

**Q There have been major developments in Middle East telecommunications over the past five years. Do you believe the trend will continue?**

**A** It must be remembered that in most Arab states the development of sophisticated telecommunications systems is not limited by financial resources, but by the difficulties of planning, purchasing and installing. In the history of telecommunications, this is exceptional because of the intensive nature of capital investment in the building and expansion of telephone networks. As for the future, I believe that in some countries the rapid rate of increase will continue for a considerable time to come.

**Q Will there be any new trends?**

**A** Yes, there is likely to be a move in which a part of the available financial resources will be used for introducing more modern equipment.

Some Arab states, such as Saudi Arabia, Kuwait, Iraq and Lebanon have already introduced subscriber dialling, and Saudi Arabia will have a telephone switching system based entirely on computer control within three years.

**Q What problems do major telecommunications firms face in the Middle East?**

**A** The first to come to mind is that the telephone administration does not have the capacity, capability or authority to take necessary decisions. Another is that buildings needed to house the equipment are not ready in time, and there have been projects that have been held up for a year because of this.

It is easy to imagine the extra cost that creeps in when an entire installation crew, brought in from abroad, will either have to sit and wait for several months or be sent away, and then recruited again when needed. Supplies

can also be hit by bottlenecks at harbours and airports, although this is a problem that is being overcome.

**Q** Many Arab states are proud of their rapid development. While this is impressive, surely there is still a lack of local technicians to carry out maintenance?

**A** In my opinion, we will shortly find that too much money is being allocated to building and installation, and we will find ourselves in the position of having nobody to take care of the equipment. This is not only true of telecommunications, but also of harbours, airports, hospitals and roads. Normally the supply contracts include certain provisions for the supplier to maintain or even operate the system or plant during its initial stages.

The day will come, however, when the proper organisation of the country must take over and purchasers must be aware of the long time it takes to train staff to operate sophisticated equipment. So I fear that we will face the next bottleneck in the field of operation and maintenance, which could result in bad service and deterioration.

**Q** Arab officials have complained of the get-in-and-out-quick attitude of some western firms. Will such companies have to show a more long-term responsibility?

**A** Yes. It is only too easy, and tempting, with over capacity in industry, to sell as much as possible. This is alright in the short term, but in the long term it is important that a domestic or public organisation take full control. Suppliers must be prepared to take on greater responsibility, not only to train staff, but also to advise on the necessity of training at an early stage. The need for this is increasing with the complexity of equipment and the price of training is not always visible in purchase contracts. If the buyer requests training at a later stage the cost can either tempt them into reducing or eliminating it altogether.

**Q** Will the time come when the Arab states develop their own telecommunications?

**A** Sooner or later in developing countries the telecommunications industry is examined. But in the Arab countries, where there is a shortage of manpower and an abundance of investment money we will probably find that they will invest mainly in industries using large amounts of capital investment and less manpower, a factor that rules out telecommunications. ■

## ALGERIA

### TELECOMMUNICATIONS, TV RELAY BEING EXTENDED TO RURAL AREAS

Algiers EL MOUDJAHID in French 1 Jun 78 p 3

[Article by Rabah Berrabah: "Telephone Central Being Installed at Tindouf"]

[Excerpts] Oran (from our office). Mr Mohamed Zerguini, minister of Postal Services and Telecommunications, arrived yesterday morning at Bechar, from Tindouf where he had conducted an important inspection tour.

In this daïra, the minister inspected the telephone central which is being installed, and which will be equipped with several lines.

With a population of 140,000 and covering an area of 305,242 square kilometers, the Bechar wilaya is composed of four daïras and 13 districts scattered throughout the vastness of the South. The problem of communications was acutely felt prior to 1965. Populations were isolated and lived on the fringes of a society in full transformation.

To put an end to this situation, the government has instituted an overall strategy aiming to eliminate regional disparities.

In the case of telecommunications, it should be pointed out that an automatic central was built and placed in operation in December 1975. This establishment can be expanded to 10,000 lines and its facilities presently allow for connection to 5,000 subscribers. In addition it includes a telegraphic central which will go into operation shortly.

It must also be noted that Kenadza, a town 30 kilometers away from Bechar, has been connected to the national automatic network, and work on the Bechar-Djdid automation is nearing completion. A radio single-channel link has also been established in the wilaya in addition to the three call-box lines serving the socialist villages of Abadla.

With respect to the automation of daïra administrative centers, it is appropriate to point out again that telephone centrals have been established at Tindouf and Beni-Abbes. The latter are being installed. As for the one at Abadla, work is estimated to be 80 percent complete.

#### TV Broadcast Reception

Another major achievement is the installation of the 300-channel coaxial cable linking Saïda to Bechar. Work in connection with the radio bands which will link the Bechar, Adrar, and Laghouat wilayas is in progress.

In order to allow the introduction of television into the region, three satellite communication stations have been fixed at Bechar, Beni-Abbes, and Tindouf, respectively.

Given the extreme isolation of the wilaya's southern area, the establishment of these technical installations is more than significant. Endowed with very modern equipment, these stations are linked to the main station at Lakhdaria by satellite, thanks to a computer named Dama. This computer receives inter-station frequencies by means of a signal sent by each center, in order to determine whether the circuits are free or busy.

A small computer located at the different stations automatically selects broadcast and reception frequencies. The need for high quality telephone connections at these stations arises from signal reception at the Lakhdaria station and retransmission on TV antennas.

Along with land stations, it should be said that there are radio link centers at Bechar, Beni-Abbes, and Tindouf. These centers are interconnected and provide telephone services.

With this glimpse of the scope being acquired by postal and telecommunication services in the Bechar wilaya, it should be stated that while the first and second four-year plans have made possible the initial steps in modernizing the telecommunications network, work is not yet completed on the automation of administrative centers in the wilaya and daïras.

The effort proposed by PTT (Mail, Telegraphs, and Telecommunications) for postal service within the special program for southern wilayas aims to assure service to the area's least favored zones. Taking into account the increased number of dwellings and activity which will arise from local economy development, it has been proposed that 15 postal agencies be established and that three distribution offices be renovated.

In matters of telecommunication, it has been proposed that four telephone centrals be built at Kenadza, Bentounis, Abadla, and Tindouf, respectively. And finally, isolated localities will be connected to the national network.

## ALGERIA

### BENINESE TO BE TRAINED AT ORAN TELECOMMUNICATIONS INSTITUTE

Algiers EL MOUDJAHID in French 30 Apr 78 p 4

[Article: "Beninese Agents Will Take Training at the Oran Telecommunications Institute"]

[Text] Beninese telecommunications employees will receive university and vocational training in Algeria at the Oran Telecommunications Institute, stated a joint communique signed yesterday morning by Mohamed Zerguini, minister of posts and telecommunications, and Richard Rodriguez, minister of equipment of the Popular Republic of Benin, shortly before the Beninese minister's departure.

During his visit, from 24 to 29 April, Richard Rodriguez visited the telecommunications complex at Algiers-Mustapha, the SONELEC [Algerian National Company for the Manufacture and Installation of Electrical and Electronic Equipment] cable manufacturing plant at Oued-Smar, the post office check center, the accounting center of the posts and telecommunications administration, the aerospace telecommunications center at Lakhdaria, the telecommunications institute at Oran, the main receiver's office in Oran, and the postal sorting center in Algiers.

"During their conversations," specifies the text, "the two ministers stated that their views were completely identical regarding cooperation between the two countries in the matter of posts and telecommunications, dynamic factors, and strengthening the economic ties between both countries and the bonds of friendship between both peoples."

"The Algerian minister, Mohamed Zerguini, responded favorably to his counterpart's request to see Beninese telecommunications employees acquire university and vocational training in Algeria, at the Oran Telecommunications Institute."

"Furthermore, both ministers agreed to take adequate measures to improve postal and financial exchanges between Algeria and Benin. They also decided to cooperate in the matter of developing posts and telecommunications. The methods of implementing this decision will be discussed at the next meeting of the Joint Algerian-Beninese Committee, which will take place in May 1978 in Cotonou.

"Both ministers were pleased with the atmosphere of fraternity and complete understanding that prevailed during their conversations. This bodes well for relations between the two countries which are to be strengthened according to directives from the two chiefs of state.

"Richard Rodriguez thanked his counterpart, Mohamed Zerguini, for the warm and brotherly welcome given to him and to the delegation that accompanied him.

"The Beninese minister of equipment has invited the Algerian minister of posts and telecommunications to visit him in Benin. Mohamed Zerguini has agreed in principle to such a visit," the communique concluded.

11500

CSO: 4400



TELECOMMUNICATIONS AGREEMENT CONCLUDED WITH FRANCE

Beirut L'ORIENT-LE JOUR in French 9 Jun 78 p 11

[Text] More than two-thirds of the financial aid covered by the protocol signed between France and Lebanon in Beirut on 2 June will be devoted to telecommunications.

It will be recalled that the agreement is for the sum of 240 million francs (or 150 million Lebanese pounds), all of which is to be used to purchase sophisticated French equipment: 110 million Lebanese pounds for urban international electronic telecommunications centrals at the end of the Beirut-Marseilles cable; 10 million Lebanese pounds for electrical equipment, substations and transformers; 14 million Lebanese pounds for two high-power computers to be used by management and eventually private customers; and 15 million Lebanese pounds for two household garbage incinerator plants. These two plants must be able to be taken down and moved when two other composting plants, damaged during events, go back into service.

The Lebanese Government will have international calls for bids for all of these projects. If the French companies do not take them, other projects will be substituted for them. In this way, Lebanese television could receive the equipment, especially a transmitter, which it needs.

Credits will be distributed as follows: 60 million francs in credits from the Treasury, repayable over 20 years with a grace period of 2 years and with interest of 3.5 percent; and 180 million in commercial credits backed by COFACE [expansion unknown], spread over 10 years and with an interest rate on the order of 7.5 percent.

It is to be emphasized, both with respect to France and Lebanon, that this is the first financial agreement of this importance signed by Lebanon for its reconstruction.

11,464

CSO: 4800

U.S. MARKET GOAL OF FAST-GROWING JEUMONT-SCHNEIDER

Paris L'USINE NOUVELLE in French 22 Jun 78 pp 34-35

[Article by Helene Pichenot: "Telecommunications: Successful Diversification with Jeumont-Schneider"]

[Text] There are still some lucky telecommunications manufacturers. Jeumont-Schneider is one of them. The firm launched its "telephony" activity a short while ago under the skeptical and slightly mocking regard of the traditional members of the profession. Today JS [Jeumont-Schneider] activity in the telephone industry constitutes a successful diversification, since in 1978, with a turnover of 150,000,000 fr, the "telephony" department will represent 8 percent of JS activities (1,798,000 in 1977); in 1979 the department should account for 10 percent of company sales.

"However, we have no preconceived idea other than that of entering into private commutation, given our military experience in that field", explains Paul Denis, in charge of the "telephony" department. At the end of three months of commercial activity JS can boast of possessing a profitable department and one that is growing 15 to 20 percent per year. "We have succeeded with private commutation and our electronic systems have pleased the PTT". So that 18 months ago JS found itself among the lucky prize-winners in a competitive examination launched by the Administration, an examination on URA [Units for Linking Subscribers] research and development. Thanks to the study contract assumed by the DAI (Management of Industrial Affairs in Telecommunications), a prototype is in the process of being installed.

Then, three months ago the firm achieved a new success by finding itself among the winners of a consultation for the DAI on satellite exchanges. Relatively modest telephonic exchanges of 300 to 8,000 lines are involved. The PTT's objective is to find an electronic replacement for "Socotel SI", with which French rural areas are equipped. Moreover, this medium-sized exchange must be exportable and easily adaptable abroad. It would be ready in two years. Thus Jeumont-Schneider has made the leap and become a potential PTT supplier, with all that implies, but also with the constraints and difficulties that go along with it.

However, the firm has ambitions other than the French market. This year it began exporting activities. "We expect to realize 10 percent of our turnover from it in 1978. To that end we must increase our production range and our slogan will be from 9 to 9,000 lines". Of course the firm is aware of the gigantic size of its competitors, but that does not prevent it from being encouraged. French-speaking countries like Belgium, Tunisia, Morocco are its preferred terrain, but also Spain, the Arab countries, the Far East. "We have installed a telephone exchange in Mecca and 38 systems in Saudi Arabia". But the JS "telephony" department is going still farther and its next step is quite simply to attack the American market, which represents 200,000,000 users. "We are prospecting in that country with the aim of selling our materials there".

JS assets consist basically of its Jistel range, which goes from a small auto-commutator of eight network lines (+ 23 subscribers) to the TLC 10, a subscribers' exchange capable of going as high as 6,700 lines, or the tape exchange, the real center of the network. Thus, for the Lyonnais Credit JS installed 52 tape exchanges. Each one has an internal system at its disposal: a console, remote interrogation. "Telemaintenance is an idea we expect to exploit for exportation".

We also recall that JS started its telephonic activities with the famous temporal technology, which necessitates very long technical studies. But that puts it directly among the French private commutation greats.

For the moment, JS employs 200 persons at Puteaux, 250 at Champagne and 400 at Montceau-les-Mines in its telephonic activity, which can only expand. "Moreover", Paul Denis adds, "the forecasts for the year were accomplished by the end of May". However, the entry of the firm into the telephone industry have not aroused approval only; after the attacks by competitors in the private telephone industry, who thought JS prices were too low, this company's arrival today in the public telephone industry seraglio has not happened without provoking some unrest, at a time when the PTT's market is in danger of shrinking and when employment is threatened by changing technology. But does not good fortune thrive for those who are bold?

8946

CSO: 5500

FRANCE

# HOPE STILL SEEN FOR NATION'S TELECOM EXPORT POSITION

Paris L'USINE NOUVELLE in French 15 Jun 78 pp 40-41

[Article by Helene Pichenot: "Telecommunications: All is Not Lost"]

[Text] Different wavelengths, uneasiness, tensions and an obvious lack of results--such are the characteristics of the present relations between the PTT [Postal, Telegraph and Telephone] Administration and the telecommunications industry. However, the restructuring of the sector that occurred in May 1976 had been announced euphorically by the Public Authorities: financial manna, "super-technologies", exports, everything for that industry that is so lucky--in the midst of a general down cycle. Today it is time to draw up a first balance sheet of the planned economy policy conducted by the government in the telecommunications area.

Of course; the telephone is improving and a drastic remedy (130,000,000,000 fr in five years) has been administered to the French system. The 10,000,000-subscriber point was passed at the end of 1977 and there should be 20,000,000 in 1982. However, the Sitt manufacturers represent in the aggregate a turnover of 10,000,000,000 in 1977, 70 percent of that amount obtained through PTT orders. But public investments are reaching their ceiling and are going to decline after next year. If the manufacturers do not provide for their future, it may be a disturbing one, all the more so since employment estimates are very pessimistic. Indeed, taking into account the fact that technology has moved from electromechanical to electronic, one job in two is in danger of disappearing in the next five years. The explosion of new telecommunications services should mitigate these employment decreases, but it is still necessary for the traditional telecommunications companies (there are 62,000 jobs at Sitt) to manufacture "telematic" products instead of more dynamic newcomers who would create jobs while causing "telematic" workers to be laid off.

Exports should constitute another compensation for decreased employment. But, two years after the euphoria (it was anticipated that each telecommunications firm would realize 30 percent of its turnover from exports in 1980), tomorrow looks difficult.

The French are not distinguished by their success in the international markets which have been carried off little by little by LM-Ericsson, ITT [International Telephone and Telegraph], ATT [American Telephone and Telephone and Telegraph], Northern Telecoms, Philips, GTE [General Telephone and Electronics] and the others. Even though Norbert Segard affirms with regard to the resulting decline in imports "that explanations, even excuses, can be found for this situation". There is still pessimism about the 1980 horizon for the 30 percent of orders that he states will reach export. But 1978 looks hardly any better, since the orders recorded in 1977 have diminished to 6 percent for export. It is basically replacement material that is affected, which is not surprising because, apart from the temporary EIO [expansion unknown] exchanges of CIT [Commercial Investment Trust]-Alcatel, the materials proposed by French industry are under foreign licensure.

Of course, the PTT technocrats tried to find palliatives for this problem and are singing the praises of a semi-public corporation to promote exporting--which worries the manufacturers, who see in it a dangerous interference in the conduct of their affairs--of course, Norbert Segard is proposing increased co-operation between manufacturers and Public Authorities, and also special measures. The results are there to be seen; skepticism reigns.

Thomson's entrance was the ruling idea of the May 1976 industrial restructuring; it is no doubt premature to wonder today if Thomson has passed its entrance examination, but we can examine the group's future in commutation.

The motivations of Paul Richard, president of Thomson who died in June 1976, were very precise: the group needed to rebalance its civil and military activities. The telephone constituted one of the most promising diversifications from the financial and industrial point of view, given the recovery plan the government was going to start. Moreover, Thomson wished to apportion better its domestic and foreign markets, taking into account the hazards that exportation brings with it. Finally, would the first "French electronician" have been able to stay away from the telephone at a time when electronic commutation was about to explode?

The PTT administration saw Paul Richard's wishes with a very clear eye, for Thomson's entry allowed it to reduce the importance of traditional suppliers, ITT and CGE [General Electric Company], to make a part of the telecommunications industry French and--Thomson having a very good exporting reputation--to have a champion in that area.

Thomson-CSF [General Radio Company] seems to have reached its objectives: it had a turnover of 13,000,000,000 in 1977 and its telecommunications activities accounts for over 5,700,000,000 of that. Its part of the French telephone industry puts it in the top class of PTT suppliers with 42 percent of the orders (LMF [expansion unknown] 25 percent and SFTE [expansion unknown] 17 percent), as compared with 32 percent for CGE, 10 percent for AOIP [expansion unknown] and 16 percent for CGCT [expansion unknown]. As for electronics, LMF and SFTE will take about 40 percent of their 1978 orders in electronic lines.

For the moment, the French group has not succeeded in penetrating the foreign market. Also, the impatience of the telecommunications civil servants may seem a little unusual, the more so because Thomson, after the restructuring, found itself in control of two commutation systems under foreign licenses. Of course, the Swedish AXE [expansion unknown] exchange is experiencing a success unequalled anywhere in the world, for since France selected LMT-Ericsson as a supplier ten countries have followed suit. But Thomson needs a personal and French label.

Two or three months ago a GIE [Economic Interest Group] was set up to coordinate between LMT and SFTE, responsible for the two firms' commercial strategy, for exports and for defining the policy to be brought out. We might wonder why it took almost two years to develop that entity. How Thomson can pull itself out if it does not further rationalize its activities in that area; two companies, almost 20,000 persons, and a long list of competing products.

It is vital for the group to generate a single range of telephone exchanges. Moreover, it is the GIE's long-term objective: a temporal stored program range. The tape exchange, MT 20, developed by LMT is one of the pillars of this range.-- the first one will be installed in Aubervilliers in 1979. The next year the MT 25 will be announced, which is a subscribers' exchange of high and middle range, the MT 30, which is smaller, and finally the MT 35, intended for rural areas. Studies and development are being directed by the same person in both companies. LMT will specialize more in tape exchanges and SFTE in subscribers' exchanges.

Furthermore, the agreements tying Thomson to Swedish Ericsson should result in rapid temporalization of the AXE system, but competition between that exchange and Thomson's future range will be felt, will it not?

So exporting can only explode if Thomson is technologically armed. But the telephone problem enters a much more general framework; it can only be solved if the firm recovers the dynamism, audacity and enterprising spirit it had in Paul Richard's time and if the present managers of the group succeed in avoiding the administrative inertia in which Thomson threatens to become bogged down.

8946  
CSO: 5500

FRANCE

CNES, TDF PLAN TELEVISION BROADCAST SATELLITE

Paris ELECTRONIQUE ACTUALITES in French 19 May 78 pp 1, 15

[Article by D. Levy]

[Text] France has every intention of moving ahead in the field of television broadcasting by satellite. In accordance with the wish expressed by the High Council on audio-visual media in favor of a direct radio broadcasting system by satellite, CNES [National Center for Space Studies] undertook, jointly with Telediffusion de France (TDF), a preliminary study on a national or bilateral design for a direct broadcasting television satellite. No specific operational project has been announced but "we are acting as though we had to meet a specific need 8 to 10 years from now." However, the most plausible hypothesis seems to be the development of an experimental European satellite ("H-SAT") from which a direct broadcasting operational television program would be derived ("TVBS"). Indeed, now that the initial reserve is past, the Europeans' interest in such a system seems nearly unanimous.

The goal assigned to CNES and TDF with regard to television broadcasting is to develop new technology existing in the national industrial domain to render them more competitive on the space market. In other words, our industrialists must demonstrate their ability to launch a direct broadcasting television satellite for domestic or foreign use.

There is no question of a national program as of now, particularly since the complexity of the television organization's structures does not lend itself to quick decisions: indeed, it is up to the television stations to determine their needs. At any rate, no urgency is seen in this area.

However, TDF is acting "as though specific needs would definitely materialize 8 to 10 years from now," and has prepared a plan utilizing the frequencies assigned during the Geneva Conference on direct television broadcasting that was held last year. On this basis, CNES undertook a study to design a 12 GHz television satellite capable of broadcasting four TV programs with national coverage.

## Developing Power Tubes

The resolution on the part of France to move ahead in this field in accordance with the wishes of the High Council on audio-visual media -- which declared itself in favor of setting up a direct radio broadcasting system by satellite -- is perhaps akin to the aboutface of other European countries that ultimately joined the ESEA's "H-SAT" project. Eleven European states are participating so far in a 6-month study of this experimental direct broadcasting television satellite to be concluded by mid-October of this year.

By now it looks as though there is a good chance that the participants of the program will decide at this time to go into the developmental stage. The cost of this program is about 400 million francs, including the expenses of launching with the aid of an "Ariane" rocket. The "H-SAT" satellite, which weighs 900 kg in geostationary orbit and would be developed by the Eurosatellite Consortium sponsored by the Aerospatiale, MBB and ETCA, could be launched by the end of 1981. Thereafter, an operational "TVBS" European direct television satellite could be derived from "H-SAT."

It is more these programs, designed in the European context, that will benefit so, it is believed, from the preliminary studies conducted on the national level by CNES and TDF. Hence, the interest in quickly placing our industry in a competitive position on the market. At this point, all the elements of the satellite seem easy to manufacture, with the exception of the power tube (a model with power in excess of 200W would be necessary for a country comparable to France). Currently, only Hughes, an American company, is capable of submitting a bid for a 200W tube, while the German company AEG-Telefunken is studying a coupled-cavity model capable of achieving an output of 500W. Thomson-CSF also intends to be in the running, and believes it can produce the necessary tubes.

Aside from the materials on board (receiver, frequency converter, etc.) TDF and CNES have undertaken a study to develop ground stations. Studies to develop critical elements of these stations (with an antenna diameter of 0.90m) such as the 12 GHz amplifiers, the mixers and the demodulators, have been assigned to manufacturers such as SNEC (Societe Nouvelle d'Electronique du Calvados) or the RTC. Note also that Thomson-CSF is developing, under a Thomson-Brandt contract, a complete station equipped with an antenna 0.90m in diameter.

All this equipment was utilized during the demonstration of TV reception by satellite (simulated) conducted at the recent MIP-TV in Cannes. A 12 GHz broadcasting station was installed at Puy-de-Dome and is obtaining three channels to permit reception tests (in May and June). This will then be followed by propagation measurements taken by TDF. The latter will also utilize the narrow beam of the experimental satellite of the ESA, "OTS," whose broadcasting power is similar to that of a direct TV satellite, to take other full-scale measurements.



Aside from the projects designed on a European scale, the preliminary French studies will permit our industry to attack the Third World market from a good position. Actions have already been undertaken by CNES and TDF (for example, during the Lima Seminar that was just held from 15 through 19 May) to convince the interested countries of the advantage of going the satellite route in the absence of a ground network. In order to sound out this market, an economic interest group will be set up between CNES, TDF, and France Cables and Radio.

9179

CSO: 5500

# TWO-DIMENSIONAL DIGITAL FILTERS FOR IMAGE PROCESSING

Milan ALTA FREQUENZA in Italian Feb 78 pp 78-82

[Article by L. Delcaro, G. Sicuranza, Institute of Electrotechnics and Electronics, University of Trieste]

[Text] Abstract. The following presents a new method of systematic optimization that makes it possible to design FIR or IIR [expansions unknown] two-dimensional filters by using data obtained in the area of frequencies. This makes it possible to impose linear connections between the coefficients of the filter transference function, connections that can be used to seek specific characteristics such as symmetry, etc. Also given are illustrated examples of the filtering of some images of a biomedical nature that make it possible to evaluate the advantages in the use of enhancement techniques based on the use of the  $z$  transformation.

## Introduction

In this work is presented a new method of designing recursive and non-recursive two-dimensional digital filters, which, derived from specifics in modulus and phase in the area of spatial frequencies, make it possible to obtain directly the coefficients of the transference function. This is an extension of the method presented in (1) and (2) [of the bibliography] for the two-dimensional case of the complex variables  $z_1$ ,  $z_2$  and presents, as its main feature, the possibility of introducing in a simple way connections among the variables to be calculated. Such connections turn out to be useful not only for seeking particular characteristics in the filters (symmetry, resolution in elementary structures, etc.) but also to set up stable conditions for them. The tests conducted have demonstrated that the method is particularly effective if first- and second-order filters are to be designed to deal with the examples reported; more complex structures can be constructed in more steps, as indicated in (3). On the other hand, the experiment done in the area of image enhancement allows us to affirm that with very simple filters, too, significant results are obtained with calculation times greatly reduced in comparison with those that can be obtained with, for example, Fourier's rapid transformation technique. Indeed, it is clear that by increasing the number of filter coefficients the advantage of enhancement techniques based on the use of the  $z$  transformation is rapidly reduced (4).

The better to justify what has been said, it is necessary to show some images of a biomedical nature that have been treated with simple digital filters designed by us and obtained by the enhancement system perfected by the Institute of Electrotechnics and Electronics of the University of Trieste (4).

#### Projection Method

The method of projection developed by us makes it possible to calculate the coefficients of the transference function

$$(1) \quad H(z_1, z_2) = \frac{A(z_1, z_2)}{B(z_1, z_2)} = \frac{\sum_{n_1=0}^{N_1-1} \sum_{n_2=0}^{N_2-1} a_{n_1 n_2} z_1^{-n_1} z_2^{-n_2}}{\sum_{m_1=0}^{M_1-1} \sum_{m_2=0}^{M_2-1} b_{m_1 m_2} z_1^{-m_1} z_2^{-m_2}}$$

based on the specifics assigned in the plane of the frequencies  $\omega_1/2\pi$ ,  $\omega_2/2\pi$

$$(2) \quad H_m(k_1, k_2) = R_m(k_1, k_2) + j I_m(k_1, k_2)$$

for a grid  $K_1 \times K_2$  points, with  $k_1 = 0, 1, \dots, K_1 - 1$  and  $k_2 = 0, 1, \dots, K_2 - 1$ .

This is based on an optimization procedure that minimizes the deviations among the values that the function

$$H(e^{j\omega_1 T_1}, e^{j\omega_2 T_2})^*$$

assumes in the points of the aforementioned grid and the specifics assigned. More precisely, in simplifying the calculation of the coefficients in (1) above, it is necessary to minimize the sum of the moduli of the deviations

$$(3) \quad e = H_m(k_1, k_2) B(k_1, k_2) - A(k_1, k_2)$$

which is obtained from the actual deviation

$$(4) \quad \varepsilon = H_m(k_1, k_2) - \frac{A(k_1, k_2)}{B(k_1, k_2)}$$

by multiplying at every point (4) above by  $B(k_1, k_2)$ .

\* In the following, it will be assumed that the sampling intervals  $T_1$  and  $T_2$  are unitary, and for all the functions of the type  $H(e^{j\omega_1 T_1}, e^{j\omega_2 T_2})$  the simplified notation  $H(k_1, k_2)$  will be used.

Deriving the sum of the moduli of the deviations (3, above) calculated at every point on the grid with respect to the coefficients a and b of (1, above), there is obtained a linear system whose solution allows the same coefficients to be calculated.

The process can be improved if it is made iterative by introducing at the l-th iteration an opportune weighting function:

$$(5) \quad W_l(k_1, k_2) = \frac{1}{|B_{l-1}(k_1, k_2)|^2}$$

Indeed, by treating thus the total deviation

$$(6) \quad \varepsilon = \sum_{k_1=0}^{K_1-1} \sum_{k_2=0}^{K_2-1} |H_m(k_1, k_2) B(k_1, k_2) - A(k_1, k_2)|^2 W_l(k_1, k_2)$$

we have a practical way of obtaining the same values of a and b as would be calculated by minimizing the actual deviation:

$$(7) \quad E = \sum_{k_1=0}^{K_1-1} \sum_{k_2=0}^{K_2-1} \left| H_m(k_1, k_2) - \frac{A(k_1, k_2)}{B(k_1, k_2)} \right|^2$$

The system that makes it possible to calculate the coefficients of the filter is obtained by deriving equation 6 with respect to the variables  $a_{pq}$  and  $b_{rs}$  (with  $p = 0, 1, \dots, N_1 - 1$ ;  $q = 0, 1, \dots, N_2 - 1$ ;  $r = 0, 1, \dots, M_1 - 1$  and  $s = 0, 1, \dots, M_2 - 1$ ).

The derivatives take the expression

$$(8) \quad \frac{1}{2} \frac{\partial E}{\partial a_{pq}} = \sum_{n_1=0}^{N_1-1} \sum_{n_2=0}^{N_2-1} a_{n_1 n_2} \gamma_{pq n_1 n_2} + \sum_{m_1=0}^{M_1-1} \sum_{m_2=0}^{M_2-1} b_{m_1 m_2} \partial_{pq m_1 m_2}$$

$$\frac{1}{2} \frac{\partial E}{\partial b_{rs}} = \sum_{n_1=0}^{N_1-1} \sum_{n_2=0}^{N_2-1} a_{n_1 n_2} \partial_{n_1 n_2 rs} + \sum_{m_1=0}^{M_1-1} \sum_{m_2=0}^{M_2-1} b_{m_1 m_2} \lambda_{rsm_1 m_2}$$

ove si è posto (where it is given that:)

$$\gamma_{pq n_1 n_2} = \sum_{k_1=0}^{K_1-1} \sum_{k_2=0}^{K_2-1} W_l(k_1, k_2) \cos \Theta_{pq n_1 n_2}(k_1, k_2)$$

$$\partial_{pq n_1 n_2} = - \sum_{k_1=0}^{K_1-1} \sum_{k_2=0}^{K_2-1} W_l(k_1, k_2) [R_m(k_1, k_2) \cos \Theta_{pq m_1 m_2}(k_1, k_2) - I_m(k_1, k_2) \sin \Theta_{pq m_1 m_2}(k_1, k_2)]$$

$$\lambda_{rsm_1 m_2} = \sum_{k_1=0}^{K_1-1} \sum_{k_2=0}^{K_2-1} W_l(k_1, k_2) |H_m(k_1, k_2)|^2 \cos \Theta_{rsm_1 m_2}(k_1, k_2)$$

(with)

$$\text{con} \quad \Theta_{uvij}(k_1, k_2) = \omega_{k_1}(u-i) + \omega_{k_2}(v-j)$$

By letting the derivatives equal zero and making  $b_{00} = 1$ , there is obtained a system of  $N_1 N_2 + M_1 M_2 - 1$ , independent linear equations in as many unknowns ( $a_{pq}$  and  $b_{rs}$ ). The coefficients and the noted limits of the system depend, not only on the choice of the grid and the value of the specifics at each point of the same grid, but also on the weight function  $W_1(k_1, k_2)$ , which is assumed equal to 1 at the first iteration and calculated successively by formula 5, above.

The method developed lends itself effectively to the introduction of linear groupings of the type

$$(9) \quad \sum_{n_1=0}^{N_1-1} \sum_{n_2=0}^{N_2-1} \alpha_{n_1 n_2} a_{n_1 n_2} + \sum_{m_1=0}^{M_1-1} \sum_{m_2=0}^{M_2-1} \beta_{m_1 m_2} b_{m_1 m_2} = 0$$

which involve a reduction in the number of independent equations and thereby a diminution in the orders of the system to be resolved; in practice, this means an opportune redefinition of the elements  $\gamma$ ,  $\partial$  and  $\lambda$  present in 8, above. The calculation times obtained on minicomputers, for filters with few coefficients, or with high-performance computers are very short and certainly competitive with times required by other procedures; this characteristic depends either on the numerous symmetries present in the system to be resolved or, in the iterative version, on the rapidity of convergence. Only in a limited number of cases have we noted uncertainties in the determination of the minimum in 6, above, and in particular when there occurred a large number of groups for recursive filters with a large number of coefficients.

#### Designing and Using Two-Dimensional Digital Filters

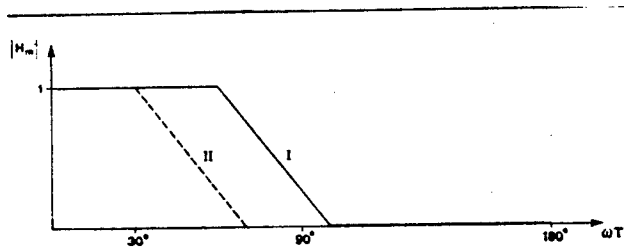
The first example refers to a first-order recursive low-pass filter

$$\frac{a_{00} + a_{01} z_2^{-1} + a_{10} z_1^{-1} + a_{11} z_1^{-1} z_2^{-1}}{1 + b_{01} z_2^{-1} + b_{10} z_1^{-1} + b_{11} z_1^{-1} z_2^{-1}}$$

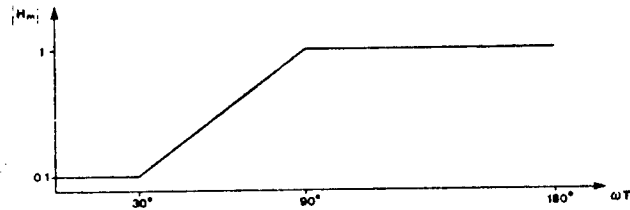
with circular symmetry calculated on the specifics reported concerning the modulus in figure 1A (continuous line); however, for the phase a linear procedure of the following type was necessary:

$$H_m(k_1, k_2) = -(\omega_{k_1} + \omega_{k_2})$$

The enhancement procedure has made it possible in this case, by using only the symmetry groups  $a_{01} = a_{10}$ ,  $b_{01} = b_{10}$  to obtain a stable filter with 3 iterations and a calculation time of only 73 seconds on a minicomputer HP 21 MX M. By imposing another group on the coefficient  $b_{11}$  of the type  $b_{11} = \cos(-1 < b_{11} < +1)$  [5, in the bibliography], there are obtained in the plane  $b_{01}$ ,  $b_{11}$  pairs of values that stand on an interior line of the triangle of stability [6, bibliog.] relating to filters that present at first approximation a similar procedure either for the modulus or for the phase and differentiate according to the gradations of symmetry.



(1) Fig. 1 A. - Specifiche per il modulo dei filtri passa-basso.



(2) Fig. 1 B. - Specifiche per il modulo del filtro passa-alto.

79

(1) Figure 1A: Specifics for the modulus of the low-pass filters

(2) Figure 1B: Specifics for the modulus of the high-pass filter

The best filter from this point of view is shown in figure 2A, and its coefficients are reported in table 1; the deviations of the long phase and the lines of plane  $\omega_1, \omega_2$  of equation  $\omega_2 = 0, \omega_1 = \omega_2$  are reported in figure 2B. It may be noted that such deviations are rather limited in the passing band, and this is particularly useful when the cases are numerous in which the specifics of linearity become important.

TAB. 1. - Coefficienti dei filtri passa-basso.

(1)

(2)

Filtro	$a_{00}$	$a_{01} = a_{10}$	$a_{11}$	$b_{01} = b_{10}$	$b_{11}$
I	0,0455141	0,1478449	0,	- 0,507953	0,282242
II	0,0135834	0,0798028	0,	- 0,614655	0,375898

(1) Table 1: Coefficients of the low-pass filters

(2) Filter

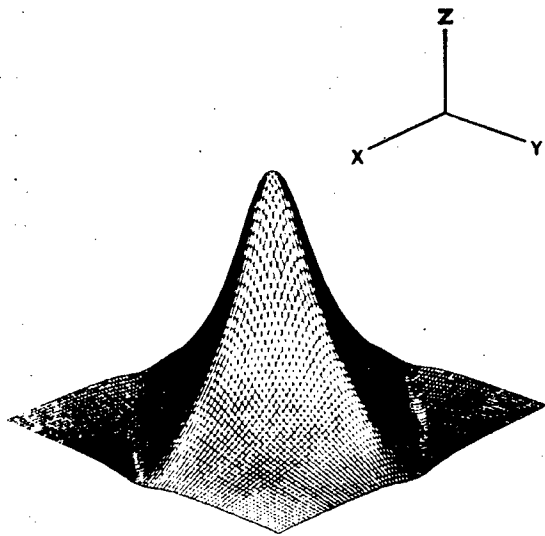


Fig. 2 A. - Vista prospettica del modulo del filtro passa-basso I.

(1)

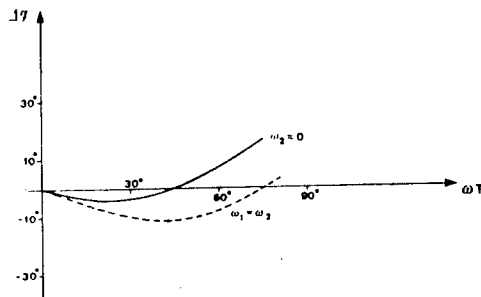


Fig. 2 B. - Scarti per la fase del filtro passa-basso I.

(2)

(1) Figure 2A: Projected view of the modulus of low-pass filter I

(2) Figure 2B: Phase deviations of low-pass filter I

Filters of this type are normally used by us in the enhancement of x-ray photographs [7, bibliog.] because it is essential in these cases to reduce the noise present in the image before undertaking any other type of elaboration. Numerous and repeated tests with low-pass filters much more complex, that is, with a higher number of coefficients, have not made significant improvements. In figure 3 is shown a radiographic image of a thorax (3A) treated with the filter examined, but figure 4A shows the same image obtained with the use of a minor passing band filter (see the curve drawn in figure 1A) whose coefficients are listed in table 1. It may be noted that with a band width thus limited there is obtained a reduction in noise combined, however, with a rather noticeable unfocusing. Similar effects have been obtained with the preceding filter by applying it twice to the image from beginning to end to obtain exactly the null-phase condition (figure 4B) [8, bibliog.]. Considering that in this case the enhancement times double, the advantage is clearly one of having available a method of projection that makes it possible to introduce additionally the specifics of phase.

(1)



(2)



(1) Figure 3A: Original image

(2) Figure 3B: Image filtered with low-pass I

As for the second example, it concerns a high-pass type filter with 17 coefficients (2nd order) obtained from the specifics reported in figure 1B for the modulus and linear phase

$$H_m(k_1, k_2) = -2(\omega_{k_2} + \omega_{k_1})$$

For this filter, too, only symmetry functions have been applied, as stated in table 2, which lists the coefficients obtained. Figure 5A shows a diagram of the filter with a section, relatively, in the first quadrant, which better shows the shape of plane  $\omega_1, \omega_2$  close to the origin. Figure 5B shows the deviations in phase, which turn out to be very slight in the interior field of the frequency. The projection required only two iterations and a time of



3 minutes 37 seconds on an HP 21 MX M computer.

TAB. 2. - Coefficienti del filtro passa-alto.

$a_{00} = -0,0265696$	$b_{00} = 1$
$a_{01} = a_{10} = -0,0371489$	$b_{01} = b_{10} = 0,137886$
$a_{02} = a_{20} = -0,0212679$	$b_{02} = b_{20} = 0,0827442$
$a_{11} = -0,0940423$	$b_{11} = 0,0972650$
$a_{12} = a_{21} = -0,0830975$	$b_{12} = b_{21} = 0,0500840$
$a_{22} = 0,873098$	$b_{22} = 0,0335457$

(Coefficients of the high-pass filter)

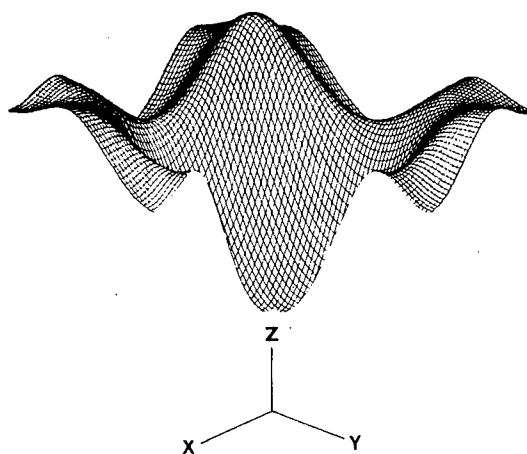
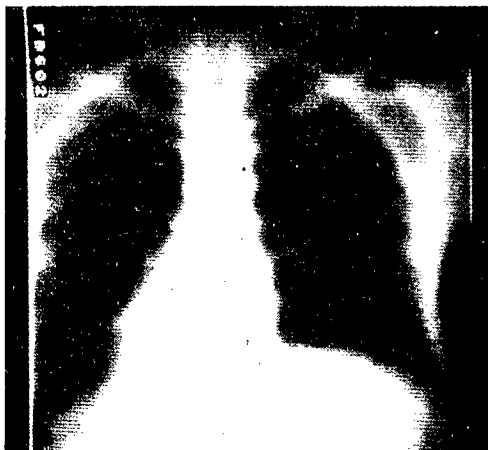
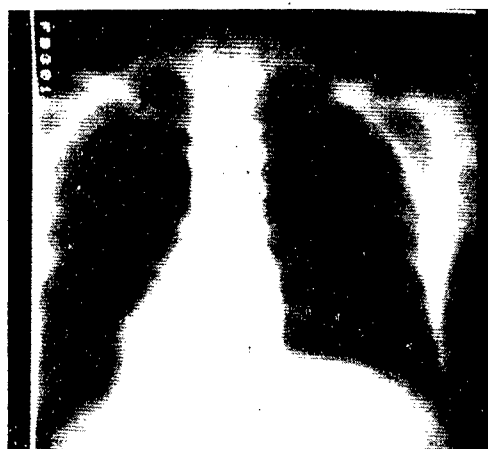


Fig. 5A. - Vista prospettica del modulo del filtro passa-alto.

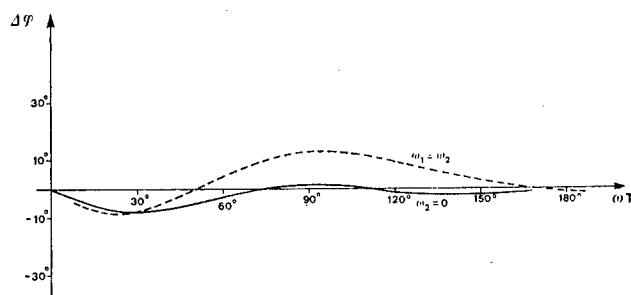


Fig. 4A: Image filtered with low-pass II

Fig. 4B: Image obtained by double filtering with low-pass I

Fig. 5A: Projected view of the modulus of the high-pass filter

Fig. 5B: Deviations for the phase of the high-pass filter

Filters of this type are very useful in enhancing images in cases where very small figure or structure contours have to be brought out and these are connected with higher frequency components. Figure 6 shows this fact clearly, in particular figure 6C, which was obtained by applying the indicated filter twice; indeed, very small retinal veins show up in such pictures when it would not be possible for them to appear in the original (6A, below).

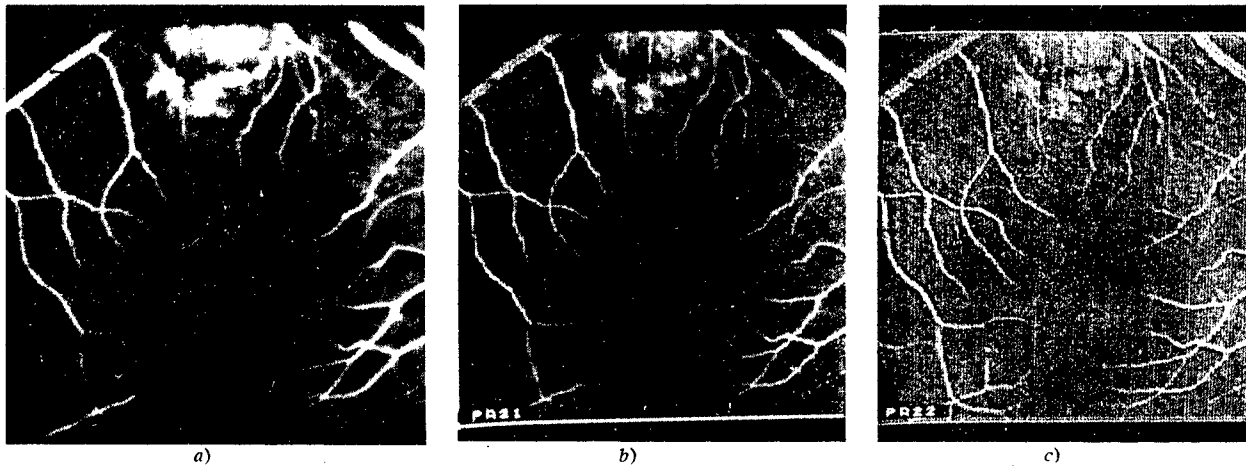


Figure 6: A) Original image  
B) Image filtered with low-pass filter  
C) Image obtained by double filtering with the high-pass filter

To complete what has been said and to evaluate better the flexibility of the method of projection, it is worthwhile to emphasize that filters of either the derivative or equalizing type can be easily designed. For the derivative type, the condition  $H_m(0, 0) = 0$  is assured by application of the function

$$\sum_{n_1=0}^{N_1-1} \sum_{n_2=0}^{N_2-1} a_{n_1 n_2} = 0$$

but to get results with the equalizing type, it is necessary to use

$$\begin{aligned} & \text{con} \\ & \text{(WITH)} \quad a_{n_1 n_2} = b_{N_1-n_1-1, N_2-n_2-1} \\ & \quad n_1 = 0, 1, \dots, N_1-1 \\ & \quad n_2 = 0, 1, \dots, N_2-1 \end{aligned}$$

In this last case, however, it must be remembered that given the great number of functions there may arise problems with the method's convergence, particularly if equalization is required on a rather wide band.

## Conclusions

Herein has been presented a new method of designing recursive and non-recursive two-dimensional digital filters that makes it possible to calculate the coefficients of the  $z$  transfer function with greatly reduced computing times and that allows the use of linear functions among the same coefficients. The examples given with biomedical type images allow us to conclude that in many cases it is sufficient to use very simple filters that can be designed very rapidly and have quite short enhancement times.

Manuscript received 21 July 1977.

## BIBLIOGRAPHY

1. Levy, E. C. "Complex Curve Fitting," in "IRE TRANS. ON AUTOMATIC CONTROL," Vol AC-4, May 1959, pp 37-44.
2. Sanathanan, C. K., Koerner, J. "Transfer Function Synthesis as a Ratio of Two Complex Polynomials," in "IEEE TRANS. ON AUTOMATIC CONTROL," Vol AC-8, No 1, January 1963, pp 56-58.
3. Delcaro, L., Sicuranza, G. "Design of Two-Dimensional Recursive Digital Filters," in IEEE TRANS. ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING, Vol ASSP-25, No 6, December 1977, pp 577-579.
4. D'Amore, A.; Delcaro, L.; Mottola, R.; Sicuranza, G. "Un sistema di elaborazione delle immagini con minicalcolatore" [A System of Image Enhancement with Minicomputers], ALTA FREQUENZA, Vol XLVI, No 1, January 1977, pp 6-11.
5. Huang, T. S. "Stability of Two-Dimensional Recursive Filters," in IEEE TRANS. ON AUDIO AND ELECTROACOUSTICS, Vol AU-20, No 2, June 1972, pp 158-163.
6. Delcaro, L. Sicuranza, G. "Progetto e impiego di filtri digitali bidimensionali" [Design and Use of Two-Dimensional Digital Filters], in AEI Symposium on "L'elaboratore elettronico nella Strumentazione Biomedica" [The Electronic Elaborator in Biomedical Instrumentation], Trieste, 29 June-1 July 1977.
7. Cortivo, P.; Dalla Palma, L.; Delcaro, L.; Nicolao, P.; Mottola, R.; Sicuranza, G. "Possibilita dell'elaborazione delle immagini con minicalcolatore in campo radiografico" [Possibility of Enhancing Images with Minicomputers in Radiography], in AEI Symposium on "L'elaboratore elettronico nella Strumentazione Biomedica," Trieste, 29 June-1 July 1977.
8. Shanks, J. L.; Treitel, S.; Justice, J. H. "Stability and Synthesis of Two-Dimensional Recursive Filters," IEEE TRANS. ON AUDIO AND ELECTROACOUSTICS, Vol AU-20, No 2, June 1972, pp 115-128.

9. Hu, J. V.; Rabiner, L. R. "Design Techniques for Two-Dimensional Digital Filters," in IEEE TRANS. ON AUDIO AND ELECTROACOUSTICS, Vol AU-20, No 4, October 1972, pp 249-257.
10. Calzini, M.; Cappellini, V; Emiliani, P. L. "Alcuni filtri numerici bidimensionali con risposta impulsiva finita" [Some Two-Dimensional Numerical Filters with Finite Impulse Response], ALTA FREQUENZA, Vol XLIV, No 12, December 1975, pp 747-753.
11. Maria, G. A.; Fahmy, M. M. "An lp Design Technique for Two-Dimensional Digital Recursive Filters," IEEE TRANS. ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING, Vol ASSP-22, No 1, February 1974, pp 15-21.
12. Maria, G. A.; Fahmy, M. M. "lp Approximation of the Group Delay Response of One- and Two-Dimensional Filters," IEEE TRANS. ON CIRCUITS AND SYSTEMS, Vol CAS-21, No 3, May 1974, pp 431-436.
13. Dudgeon, D. E. "Two-Dimensional Recursive Filter Design using Differential Correction," IEEE TRANS. ON ACOUSTICS, SPEECH AND SIGNAL PROCESSING, Vol ASSP-23, No 3, June 1975, pp 264-267.
14. Bernabo, F.; Emiliani, P. L.; Cappellini, V. "Design of Two-Dimensional Recursive Digital Filters," ELECTRONICS LETTERS, Vol 12, No 11, 27 May 1976.

8782

CSO: 5500

MODERN DATA PROCESSING SYSTEMS THREATEN PRIVACY, FREEDOM

Hamburg DIE ZEIT in German 5 May 78 pp 9-13

[Article by Horst Bieber: "The Dictatorship of the Data"]

[Text] At the end of October 1938, hectic activity reigns in the Ministry of the Interior in Berlin. It has been decided "higher up" to instigate a program against the Jewish citizens; the minister of the interior is to prepare the required lists. The legal foundations for this action have been laid shortly before: the law of 11 May 1937 on passport and immigration officers, registration of residents and identity cards; and based on it, the national registration decree of 6 January 1938, supplemented by the second notice of the Reich and Prussian minister of the interior dated 10 April 1938 (according to which the registration officials are obliged to provide information concerning the inhabitants to other civil servants, for use in their official duties).

The central computer in Berlin interrogates the state address registers, which contain 10 basic data items concerning every citizen. If the abbreviation "Jew." appears in the "Religious affiliation" column, the case is clear. If the entry is "none," the computer examines the family name and first name, and compares them with a list of typical Jewish names prepared by the SS genealogical office. If only one criterion is met, it checks the birth date and birth place; it is well known and proven in scientific works that at certain times, there have been waves of immigration from the eastern regions of the former Austro-Hungarian empire into Germany, and that many Jews were included.

The clarification of the remaining undecided cases--scarcely 3 percent--is abandoned. Tapes with the data collected in this way are transferred to the SA central office, which now determines by computer which SA unit is to take over which "cases"; the corresponding lists are printed out on the terminals of the SA battalions, and distributed at once. The systematic destruction of Jewish property in November 1938 later receives the elegant name of "Crystal Night."

This description is historical fiction. The above-mentioned laws and ordinances did actually exist, but the Nazis did not have computers available. The state address registers, which are now being considered, did not exist either--fortunately for some Jewish citizens, who were able to slip through the still

wide-meshed net of the registration procedure. The story is only to show that there are no "harmless" data. Whether they remain harmless -- that is, without detrimental consequences to the persons concerned -- depends exclusively on the political and social context, on views and tendencies or new convictions that are neither predictable nor controllable in a working democracy.

This does not always have to come to an actual attack or to physical destruction. The item "conscientious objector" is interpreted in periods of tolerance as an obvious use of a basic right; in a period of "cold war neutrality," it can be associated with "shirking" or even "treason." The item "divorced" was once considered a blot, and completely prohibited a career in some fields; but with changing times, its importance changed. A platitude that -- if it were always present -- would represent the first step in "data consciousness."

A second kind of insight must be added: a single data item gives little information. The fact that a worker named Albert Mueller worked only 52 hours last month means nothing: he may have been sick, or on vacation. Or affected by short-time. "Only the second data item (sickness, vacation, shirking, or short-time) decides whether he was a lazy wretch or a poor wretch," as a data specialist put it. It takes two data items, put together, to give a single piece of information -- which is already valuable under some circumstances. The address item "Werl penitentiary" for Albert Mueller has no information value without the second data item "convict" or "guard."

It is not the mass of isolated data concerning Alber Mueller that is threatening, but the ability to combine them. The two pieces of information "idler" and "convict," each of which was obtained from two data items, already make a decidedly negative impression on the reader. The fact that Albert Mueller may have had obvious reasons to be absent from work at the time, and may have been unjustly convicted, cannot be recognized -- thus an endless amount of further data would have to be gathered and combined, before the "real" Albert Mueller appeared.

But even these two insights are scarcely known: that information is derived from combinations of data, and that in data gathering the tendency is to make the most extensive collection possible, in order to approach the objective picture.

Still a fourth point of view must be impressed on the data consciousness that is not yet present in the FRG, but timidly coming into being. The youthful conscientious objector Albert Mueller may very well later be convinced of the necessity of serving, and join the army. Should the data item of conscientious objection stick to him forever and make him eternally untrustworthy? Should the "favor of forgetting" -- as Willi Birkelbach, the first Hessian data protection agent, once called it -- be denied him? Many candidates for public office are suffering today for the "sins of youth" that are held up to them. And although it is difficult to set an age limit between foolishness and responsibility, or to put a legal time limit on sincere changes of opinion, this much is clear: data stored for a lifetime define a person unjustifiably early and permanently; they rob him of the chance to dump the ballast of previous mistakes, and to change himself; they are "inhuman."

The data problem is not new. However, it has taken on a new dimension in the last 35 years, with the headlong triumph of the electronic computer. Only a machine is capable of collecting widely scattered data in a fraction of a second, organizing them, comparing them with predetermined criteria, combining millions of individual data items, and storing them close at hand for decades. In a logical fashion, the debate over the data problem developed parallel to the use of "electronic data processing" (EDP).

But just as many citizens did not "understand" the computer and made it into a demon or caricatured it, or uneasily pushed it out of their consciousness, so the discussion went to opposite extremes. Either "Big Brother Computer" was painted on the wall, or EDP was explained as a harmless tool for organization. To be sure, this exchange of arguments pro and con took place in a small circle of initiates. Most of the people took no part in this discussion, and did not even recognize the problem of the misuse of data. When there were protests -- like last year, when a national identity card was being considered -- they fed on emotion, muffled fears, and a general uneasiness with respect to technical progress: they were not very helpful.

All the "initiates" agree that only a general "data consciousness" can help to get a grip on the matter. "Data protection" (to use that adopted but misleading term) is really the problem of the century, the fulfillment of that central area in the Basic Law that establishes human dignity and the right to freedom, although it may not look that way at first glance.

With the "federal data protection law" (BDSG) -- or, more accurately, the "law for the protection of personal data against misuse in data processing" -- which went into effect on 1 January 1978, the lawmakers made a first attempt at regulating the subject. New legal ground was broken. Naturally, there were already regulations governing the handling of data -- for example, in the laws on epidemics and social welfare. The exact number of pertinent regulations is actually disputed among specialists -- the number is somewhere between 340 and 420 -- but except for these restrictions, the axiom is, "Everything that is not expressly forbidden, is allowed."

Under this motto, data collection by both private and public agencies began. In 1976, the Hamburg information specialist Klaus Brunnstein wrote: "According to a conservative estimate, data concerning the average German citizen are kept in more than 200 different data banks belonging to the communities, <sup>Laender</sup>, and federal government, and in another 50 to 500 commercial data banks, depending on the buying power and position of the person in question."

One cannot even guess at the number of individual data items. In addition to around 170 official data items concerning the "normal" citizen, another 150 to 300 long-lived data items can occur, depending on behavior (criminals, for example, require additional data), incidents (accident victims, sicknesses), and professional position (official in a sensitive position, for example). Private agencies, mainly in the business world, also collect between 10 and 220 data items, depending on the buying power of the individual and his participation in economic life. On 1 January 1976, there were around 25,000 data processing units in the FRG (not including the so-called middle data technology

of the small office computers), some of which are joined in a network, and some of which can be connected. Approximately 21 billion data items were stored in them -- about 340 per German citizen.

Since then, these numbers have increased. Today there are even more computers, even more data banks, even more possible combinations, and even more data items. How many? -- that will be known for the first time next year, when government authorities and private firms have met the BDSG requirement of drawing up a list of all their files with personal data. But the question of how many personal data are electronically exchanged every day, and how great the flow to and from foreign countries is, will remain unanswered.

Such large quantities are a direct invitation to misuse, especially since the person concerned finds out only in exceptional cases, what data concerning him are stored, to whom they are given, and what is done with them. In addition to the possibility of misuse, the lawmakers were motivated by the danger that electronic data storage might infringe on the inviolable right of the citizen to privacy, make him into a "glass man," and thereby injure his human dignity.

In the following examples, these two points of view cannot be completely separated, and the lawmakers did not succeed in distinguishing them either: this is clearly shown by the BDSG.

#### When False Data Are Stored

Case One: A 34-year-old employee had been trying in vain for three years to obtain a life insurance policy. Only through the intervention of an official agency did he learn that he had been found to have tuberculosis 12 years earlier, in the course of an examination by the company doctor. This finding had been stored in the central data bank of the insurance industry; but there was no indication of the fact that the TB had been cured in the mean time.

This example shows that the citizen must be given the right to correct and modify his data (as is done in the BDSG). The original opposition to these stipulations gave way, because the data-storing agencies can thus keep their data completely up to date.

#### When the Citizen Doesn't Know What Is Stored

Case Two: A traveling salesman left his company in a dispute, and could not find a comparable new job. As it later turned out, he had been put on a "black-list" as unreliable and dishonest (these charges were completely invalidated in a subsequent judicial proceeding). But the crucial point was that this list had been kept secret, and was not available to "unauthorized persons" -- in this case, the employee who had left.

The BDSG has not satisfactorily solved the problem of data transparency and verification facilities. To be sure, in the private sector every citizen is given the right to find out what is stored concerning him, but there are three catches in this provision: first, he must pay for this information; secondly,



he does not find out where his data are stored and where they are being transmitted (as false data, under some circumstances), or where they come from; thirdly, if he doubts the completeness of the information, he can under certain conditions have the data bank searched down to the last line by agents of the regulating authorities, but that immediately entails costs of tens of thousands of marks.

Data inspection in the public domain is controlled in an even less satisfactory manner. There, the BDSG in principle blocks all information in the area of security: the police, Office for Protection of the Constitution, Military Counterintelligence, and Federal Intelligence Service are exempt from the reporting obligation. Thus there is a further danger that false data, containing rumors, slander, or simple mistakes, will be transmitted along with the correct data. This is not affected by the stipulation that the federal authority for data protection (located at the Ministry of the Interior, 198 Graurheindorfer Street, 5300 Bonn 1) can intervene upon request and protest in a federal case, as the Land authority for data protection (established in Hesse and Rhineland-Palatinate) can in a Land case. The data files remain closed to the complainant.

A certain amount of secrecy must be allowed to the security agencies, in order to do their job. But the present limits are not satisfactory. In this area, the federal and Land lawmakers still have hard work to do.

#### When the Teacher Isn't Pregnant

Case Three: An unmarried, strictly Catholic teacher orders a book called "My First Child" from a mail-order book dealer -- as a present for her married sister, who is expecting her first child. Shortly afterward, sales letters and samples arrive in large numbers; manufacturers of baby food, paper diapers and children's furniture advertise, as well as a company offering education insurance. This is no secret to the villagers; they begin to whisper and to make pointed remarks.

This "case" settled itself with "no birth." But two aspects are noteworthy: the teacher did not succeed in finding out who, where and how, had put her address into circulation with the false notation "pregnant." And it sheds some light on the address business.

Every commercial manufacturer has an understandable interest in addressing an audience of potential customers that is chosen as carefully as possible. His chances are greater if more data are connected with an address. The item "male" is useful to the pipe manufacturer only to a certain extent; the additional item "nonsmoker" helps him to save money. A candy company values the item "diabetic"; a company specializing in rheumatism treatments would like to know something about the state of health of its addressees.

These various interests lead the address dealer to attach as much data as possible to a name, in order to satisfy his clients to the greatest possible extent. This can remain harmless, and only cause the mailbox, stuffed with advertising material, to be overloaded. But it can go further. If Mrs X

subscribes to a journal called MY PATTERN SHEET, she may be grateful for offers of flatirons and sewing machines; but under some circumstances, Mr X, who ordered a book called "The Nude Photo," may not be enthusiastic about invitations to buy erotic articles or to become a paying member of an off-color club. Here a protected area of privacy is encroached upon.

Above all, these increasingly detailed addresses approach a forbidden personality profile. The preferences, tastes, hobbies, and habits of a citizen can, in the course of data accumulation, be assembled to the point where the individual can be recognized. The advocates of this data collection counter with the argument that their findings are only conclusions from the known behavior of the individual: he is the one who ordered the diabetic candy, the rheumatism cover, or the nude photo book, and thus put these data into circulation himself.

There are two objections to this: first, central data collection breaches the separation between personal life and environment, which the person concerned desires in any case. And then there is always the danger that the second largest private data collector, the publicity and detective agencies, will combine its data with those of the address dealers. A company that wants to fill a confidential position has an understandable interest in checking the reliability of the applicants. The information services charged with such inquiries normally do not have access to the nucleus of personal information and the home of the subject. A possible alternative is to call up the detailed address, from which conclusions can be drawn concerning personal behavior.

Here the lawmakers had to weight two claims: the protection of private life, and the economic interests of the address dealers and the information services. Here also it behaved as Ulrich Dammann of the Hessian data protection authority once remarked: "The text of the law itself does not resolve conflicts of interest for the most part, but takes refuge from the unpleasant reality of conflicting interests in the safe world of general clauses."

Moreover, a young computer specialist has found a very simple way of tracing the data chain in commercial use. In the United States, he became accustomed to abbreviating his middle name with a W. He kept this habit when he returned to the FRG, but from time to time he changed the initial in answering an advertisement or an inquiry. Now he knows from his return mail, who has the address of Hans A. or Hans B. or Hans C., and is giving it to others.

#### When the Banks Make "Statistics" of their Clients

Case Four: A young woman was the guilty party in a divorce suit, and her ex-husband obtained an order to attach her property, which the bank of course learned from the transactions in her account. The bank refused to grant the woman revolving credit, although she had previously made all her payments on time.

Case Five: At a red light, a careless driver hits a stationary car belonging to a mason. The mason has his car repaired. When he picks it up, a driver

ignores the right of way almost immediately in front of the garage, and bangs into the rear of the car that has just been repaired. The mason has the car repaired again, but a little later he trades it in on a bigger car. His old insurance company informs him that it will not give him any liability insurance on the new car.

Case Six: An employee orders a big stereo set, which he wants to pay for on the installment plan. He returns it because it does not meet the specifications in the catalogue, and does not pay the first installment. A little later, when he wants to obtain a small loan from his bank (to pay cash for another stereo set), the bank refuses him the loan.

Banks and insurance companies, in particular, have made extensive use of the capabilities of electronic data processing, in order to minimize their risks. In the case of the young woman, the bank acted precipitately when it learned of the attachment judgment in a legal way. The mason had the misfortune to appear as a swindler in the central data bank of the auto insurance companies: fake accidents are a favorite method of insurance fraud. The fact that he was innocent in both cases (as was proven in two legal suits) did not help him much. When he requested the new insurance policy, neither of the suits had been settled, and on account of his two auto accidents within 10 days, he was under an electronically stored suspicion. Because the employee had refused to pay the first installment on his stereo set, he also appeared in the data files of the "general credit insurance protection society" as a slow payer, and thus a credit risk. In this case also, the decision of the manufacturer to take back the faulty set came too late for him.

The banks and insurance companies fought most tenaciously against the notification and information requirement in the preparation phase of the law, and they actually obtained some improvements for themselves. In business matters, the law distinguishes between two types of personal data processing. Anyone who processes such data for his own commercial purposes must inform the person concerned when the data are first stored (although the "rubber" clause "unless he has become aware of the storage in another way" largely vitiates this requirement).

The protection companies and central data files of the banking and insurance industry now fall in another area, commercial data processing for other purposes. In this case, the person concerned must be informed only when his data are first transmitted (again vitiated by the rubber clause "unless he has become aware of the storage in another way"). He can find out where the data are going only when there is a "regular" data flow -- which is not the case with a person who takes out a small loan. He is normally not successful in rolling the data chain backwards.

On the whole, the BDSG has not affected the flow of data in the private sector, with a few exceptions. Two general clauses permit data accumulation and reproduction as before (although sometimes it must take place in another form and on another basis: there must be no suspicion that "protected interests" of the person concerned will be damaged, and the person interested in the data must be able to demonstrate a "valid interest." His business interests are also included in this.

Many specialists wink understandingly when the question of protection against the misuse of data comes up. This danger is averted only to a very limited extent in the BDSG. Nevertheless, the lawmakers must be given credit for creating three foundations for future, more comprehensive regulations:

The phrase "everything is allowed" has been reversed: "Everything is forbidden, unless it is expressly allowed." This forces reflection on previous data-handling practices, sows doubt, and in many cases brings the expression "legitimate concerns" before the eyes of the EDP specialists for the first time.

The hiring of a data protection official, as required by law, in companies that use electronic data processing and fulfill certain minimum criteria, is having positive results. Although this position has remained a hybrid (the official is supposed to check up on management but is not supposed to suffer the consequences, even though he is an employee; he is supposed to be reliable and knowledgeable about data processing, but cannot be the head of the EDP service), the threat of punishment for the misuse of data expressed in the law may hasten the self-regulation on the part of private industry that the lawmakers retracted in the course of their debate.

The right of every citizen to demand information on the data stored concerning him led to an inventory of the data files on hand, which was at first loudly lamented but is now considered rather amusing. For since EDP is handled by people, it obeys Parkinson's law. All too often, some worker had indulged his passion for data collection; data files turned up that had long been considered forgotten; superfluous data were collected, organized, and carried along at great expense; tortuous, expensive channels of information were exposed. Here the law forced a reorganization that a Berlin data protection specialist judged concisely: "The gain from the reorganization far exceeds the cost of data protection." This is not necessarily true for small businesses, which are having a hard time satisfying the law -- not least because of a lack of preparation and information on the part of the authorities, who approached this law very cautiously.

All is not joy and harmony in industry either: around 30,000 data protection officials are needed; they should have been hired by 1 July last year. At the beginning of 1978, the number of persons trained for this job was about 2500.

The second aspect of the law has had a more positive reception: data insurance, or protection against theft, sabotage, and arbitrary or unauthorized modification of personal data. Technical and organizational preventive measures must be taken by the beginning of next year; these are also in the interest of the companies. On the one hand, this has to do with protection from unfair competition; but on the other hand, it also serves the purpose of protecting individuals. Thus if a stolen data file in which all the household insurance policies of a firm were stored, were to be combined with the data of a travel agency, containing vacation periods, this would be welcome information for thieves, for they would learn when and where as much as possible could be stolen, with as little danger as possible.

Then, a comprehensive "access check" guarantees that no unauthorized person can arbitrarily modify, extend, or tap the data. Thus in the first place, computer crime can be prevented: from the theft of customers' data (as happened to a large German mail-order house) up to the trick of adding the tenths of a cent to one's own account in interest computations (which almost made a German bank employee rich).

Of course, it would be wrong to brand private industry as the only data-connected offender; the government -- federal, Land, and local authorities -- holds its own, and its data consciousness is just as low. Three main charges can be made against the government:

Firstly, it was, at least up to the beginning of this year, the greatest supplier of data for private industry (the postal service or one of its subsidiaries actually made a profit from this business): from the registry office to the public works offices to the motor vehicle office, there flowed a steady stream of data to the interested parties. In the smaller communities, where the dignitaries dominated the council, the feeling that the administration was a tool of private industry was firmly established. In order to avoid misunderstanding, let us point out that this was perfectly legal; no one thought of asking whether it was also legitimate.

Secondly, the lawmakers are still the greatest data producers; their laws and regulations produce around two thirds of all personal data.

Thirdly, under the catch-word of "simplifying the organization," most of the requisites have been created for a combination of all the individual data files, in a way that still conjures up Orwell's "1984." For unquestionably, the government has access to the most sensitive personal data, with the greatest possible potential damage.

#### When the Citizen Doesn't Drive

Case Seven: In a large city, the public transportation system is organized as a stock company; all the shares are held by the city. One day, the internal revenue service comes to the city with the request to look in the EDP files of the public transportation system for the names of all those who hold monthly or yearly commuter tickets. These are to be compared with the electronically processed applications for a reduction in income tax, in order to determine who has claimed a lump sum for mileage for driving to work in his own car, but actually used the public transportation system.

This request for official help was refused. But it is a harmless example of what can be expected when computerization has set in, and the complete data stream within the government -- in this case, justified by the undeniable crime of "income tax fraud" -- is not controlled. In principle, this is not easy to regulate: each law must have a claim to complete obedience, but on the other hand, the chance to put one over on the law is part of the human quality of a society. Technically, there will soon be no difficulty in enforcing laws and ordinances to a much greater extent, and in increasing the

monitoring. If this does not happen, it can be traced to a growing awareness of the problems involved, but even more to a lack of money. "Financial need as a protector of humanity" -- why not?

In this connection there is another consideration that is raised more and more often by the authorities. Every man plays parts -- father, husband, taxpayer, defendant, debtor -- and behaves in specific ways for each part; in these parts, he gives to his environment only certain data that appear to him to make a favorable impression in that connection. The law has respected this fact for a long time. But the computer can now easily connect these pieces of information that are proper to a particular part. They are separated from their purpose, and by taking his role-playing away from the individual, they also take part of his self-realization.

#### When the Physicist Sleeps at a Friend's House

Case Eight: A married physicist, who is employed in a sensitive defense operation, wants to fly from Munich to Hamburg. Since Lufthansa is all booked up, he flies by way of West Berlin. There he has a two-hour layover, and uses it to visit an old friend. Three days later, he is asked by the security officers in his company what he did in Berlin, and whether he was "over" in the GDR.

This example shows how deeply the official data stream can penetrate into the area of privacy. The physicist either had to confess to adultery or expose himself to a suspicion that would be harmful to his career. The data stream had cut off a bit of his "privacy."

But this case also demonstrates a second danger. The computer simply combines data according to predetermined models; but these models, which were created by human beings, never completely correspond to reality. At best, they describe the normal situation. Thus the normal case is a direct flight from Munich to Hamburg, and the detour by way of West Berlin is abnormal. It is normal for a man to be married to the woman with whom he lives (or even for them to be unmarried). But the fact that they are divorced and still live together -- perhaps unwillingly, because of a lack of housing or money -- already constitutes a deviation from the normal situation; the case is rectified only for a household in which two married couples have exchanged partners through divorce and remarriage.

A man completely reduced to data runs the danger of being measured by EDP against a limited standard model. Anything that does not fit this outline (who checks on who has constructed the outline, and according to what point of view?) is exceptional, abnormal, and suspicious; it subjects the person to disapproving curiosity and, under some circumstances, forces him to conform.

Under some circumstances, it even puts him under pressure. The former SPD deputy Frank Haenschke, whose persistency first pushed the BDSG through an otherwise indifferent Parliament, cited an example from the United States in one of his speeches: "In 1958, in the United States, 280 data items concerning

239 newborn babies -- mostly group characteristics like the origin of the parents and family conditions -- were used to predict which of the 239 babies would later get into trouble with the law. Scarcely two decades later, the prediction has been fulfilled with a deviation of only 3.5 percent." Who protects us from the possibility that an over-zealous official agency, following the precept(which is valid in itself) that "an ounce of prevention is worth a pound of cure," may draw the conclusion that it should adopt this testing procedure and pursue the elimination of mistakes in a familiar way?

#### When Two Old Friends Meet Secretly

Case Nine: During the 1966-77 recession, the personnel manager of a large company and the head of the local draft board, two old acquaintances from an army division staff, meet over a beer. The factory has to lay off workers, and the officer has the glorious idea of picking out, from his data and that of the company, all the men who have been declared fit for service but deferred, and drafting them preferentially. This is done, and helps somewhat to mitigate the effect of paying benefits to those who were laid off.

Only one thing is to be retained from this clearly illegal procedure, and that is the reaction of all too many persons who hear of this incident: "We should have thought of that idea ourselves." It is unfortunately true that sensitivity to the problem of protection of the individual, and data protection consciousness, are lacking today as they were ten years ago.

There are many reasons for this. First of all, there is the principle of government supremacy, which largely exempts the administration from public monitoring (far differently from the case in the Scandinavian countries, for example), and leaves it the choice of means and types of organization, within a directed goal, and of course in compliance with the law. This has given the German executive branch freedom of action, which it has used extensively. Power centers have long since been created among the "servants" of Parliament; they owe their influence to a mastery of technical knowledge and information. There is no longer any way around them.

In the second place, there is the lack of planning in the period since the war. As this was painfully felt in the middle of the 1960s, there proved to be a lack of data relevant to planning. At the same time, EDP began to take over the city halls, attended and established by relatively young men who believed in the feasibility of planning, had the necessary tool for planning in the computer and knew how to use it, and generally thought technically and technologically, rather than politically. Thus they found themselves in a broad stream of opinion, which advocated planning in the political sphere. Today, ten years later, they are still deciding; no wonder that they are the last to be seized by doubt concerning the feasibility of planning, and by concern for the complete "computerization" of the citizen.

Moreover, one prediction has not been fulfilled: EDP did not help to reduce the staff; on the contrary, it led to a large increase. Mainly, it accelerated the extension of data; thus it created a hunger for data that made the demand curve rise exponentially rather than linearly -- in the private sector also.

In the third place, there is a legal and judicial expression that always has a great deal to do with the definition of individual degrees of freedom, that word "privacy" in American law, which is so difficult to translate into German. The Supreme Court has had to deal with this matter in many cases (the microcensus, divorce acts, medical records, mail censorship, and Lebach decisions), and in doing so has refused to set up a rigid definition of privacy; rather, it has made the protection of privacy dependent on the social context and its comparative importance.

This is not the case in the United States: when at the turn of the century, the New York scandal sheets began to rake over the way of life of the 10,000 leading citizens, they induced the passage of a law for the protection of privacy, based on two Anglo-Saxon legal principles: "My home is my castle," and "Right or wrong, it is my country (home)." Justice Brandeis summarized it in 1938, with these words: everyone has the right "to be left alone" -- a formula to which the Supreme Court referred in the Lebach decision.

The American mistrust of the government's demands for information led to the breakdown in 1965 of a plan proposed by the Bureau of the Budget for a National Data Center. Since then, the debate in the United States over data protection has never quieted down. In 1971, the Fair Credit Reporting Act went into effect for private industry, and in 1975 the Fair Billing Act. In September 1975 came the Privacy Act for the administration, whose dismissal was greatly accelerated by the Watergate incidents. Since then, the Washington government has put three large projects for national data banks on ice, because there seemed to be no guarantee of protection against misuse, and because the people took a clear position against the plans of the executive branch.

Moreover, an investigations committee under Senator Sam Ervin has discovered that the American authorities are still maintaining illegal data banks, in spite of all the regulations, and even creating new ones. His summary stated that laws alone do not greatly change the mentality and the habitual behavior of the executive branch.

The discussion raised at the end of the 1960s in the United States was the inducement for the Ministry of the Interior to prepare a draft law of data protection. But to the general amazement of the specialists, the American debate did not spill over the Atlantic. In spite of the Parliament's decision of March 1969 to write legal regulations as soon as possible, it was left to the "valiant trio" of deputies Frank Haenschke, Gerhard Baum, and Burkhard Hirsch to push the unwanted law over all the hurdles, until it finally left the two houses of Parliament in November 1976, after innumerable changes.

In those six years, it went through what may be the most changeable history of any German law. It would be worthwhile to describe it in all its details; this is a good example of the pressure of lobbies, which is exerted on parties and deputies. What came out is a law whose teeth have almost all been drawn, in the sense of effective data protection. The only consolation is that a beginning has been made, and that there is a chance for future innovations and improvements. Cynics rejoice in the fact that in spite of its lack of precision, the text of the law raises so many questions (for example, with



data transmission for research purposes, especially in medicine), that clarifications and additions are unavoidable. The first progress report of federal data protection officer Hans-Peter Bull in Spring 1979 will point the way for improvements.

The public disinterest in the fate of the data protection law and the limitation of the discussion to experts were equally responsible for the false rumor that the bill would create a federal registration law. It was already introduced in the sixth legislative session but was not fully debated, because there was a premature vote; in the seventh session, it also remained dormant -- partly as a victim of the already enhanced consciousness of data protection, which had been raised upon the introduction of a uniform personal identification number (PK).

The interior committee had let the PK pass. However, the judicial committee came to the conclusion "that the development, introduction and use of numbering systems that allow a uniform numbering of the population (PK) in the area where this law is in force are inadmissible." Behind the scenes, it was widely rumored that the killing of the PK was the work of Herbert Wehner, to whom it had been made clear how well the identification number fitted the opposition slogan, "freedom or socialism." However that may be, the standing conference of the state interior ministers rejected the personal identification number in March 1977.

The public indignation over the PK was completely out of place. In the first place, such "local" personal identification numbers already exist for over 43 million German citizens. In the second place, the PK would have facilitated electronic identification, but the computer can do the same thing with the name, place of birth, and date of birth; the unavoidable margin of error is tolerably low. In the third place, a data bank for social information has been maintained at the Ministry for Labor and Social Welfare since 1974, containing over 90 percent of all the citizens; it provides an almost equivalent substitute for the rejected PK.

Figuratively speaking, the PK is only the noisily erected crown on the rafters of a building whose completion was unnoticed. It was criticized, but the building was not.

There was an equally distorted debate over the roughly 200 data items named in the registration law, which were to be gathered and processed in a uniform fashion. The outcry over the "glass man" overlooks the fact that these data have been gathered for a long time, without the knowledge of the person concerned (who knows of or even suspects the existence of only half of all the data files referring to him, according to a study made by the Society for Mathematics and Data Processing for the Ministry of the Interior), and combined within the government agencies. A legal point: there are legal prescriptions for all the data, from the voting law to the tax laws.

In their own words, the lawmakers only wanted to prevent the situation in the states from developing separately in such a way that unification would later

be impossible. At the same time, according to Article 75 of the statute, "preservation of the uniformity of living conditions beyond the borders of a state" was to be achieved. A third aspect was not emphasized quite so loudly: to check the uncontrolled frenzy of data collection on the part of the individual agencies by means of a uniform list of the data to be stored.

To be sure, the Ministry of the Interior did not act with complete candor on this point. The maximum extent of the data that are allowed to be stored could be increased by a simple legal decree. "This interpretation is dead," Andreas von Schoeler, the Parliamentary secretary of state in the Bonn Ministry of the Interior, now explains. "There is now unanimity on this point. The list can be changed only by law," he said in the open debate in Parliament.

Nevertheless, the registration law deserves further attention -- precisely because it was not an insidious attack on the freedom of the citizen, but just a regulation and summary of facts that had existed for a long time. Thanks to EDP, the "resident registration system" has long since become a "resident system," a central data pool for the various individual agencies -- the voting, welfare, tax, health, and police agencies, etc. -- that need these data for the performance of their legally prescribed duties.

What is new is the fact that all the data are stored in one place, or in one EDP-connected system, which of course permits effective data protection for the first time through central monitoring. This contradiction cannot be resolved. No doubt the danger of misuse is also increased, but the lawmakers have great difficulty with this realization -- in their deliberations, they can hardly start from the principle that the executive branch has misuse in mind, but they must assume that it will dutifully fulfill its legal orders. Max Weber's ironic, skeptical suggestion that in order to protect freedom, "democracy" and "bureaucracy" should be organized in opposition to each other, may have been an accurate perception, but it is not a principle that can be put into action.

Fortunately or not, the registration law came into the general debate on terrorism. For in the basic draft law, it was stated quite clearly that it "takes into account the efforts of the federal government to improve the legal handling of the fight against terrorism through regulations concerning a strengthened registration requirement in lodging places, the establishment of state address registers, and a proposed unification of the individual rules of the state registration laws." The idea that every hotel keeper and landlord would become a deputy sheriff released a storm of indignation.

The protests could easily have been even louder. For the logical consequence of such pseudo-policemen is that new, forgery-proof passports and personal papers must be issued (as is planned); their numbers could let the personal identification number in through the back door (and will do so, according to the experts). And, in order to close the net really tight, a central data bank would have to be set up for the electronic comparison of all signatures with a sample signature that had been deposited. When, in addition, all airline tickets are checked (as they already are), all car rentals are reported, and it is possible to report over a nation-wide search system for stolen cars, where and when every car (with a forgery-proof identification) is located, then nothing more stands in the way of complete monitoring of the movements of every citizen.

That already sounds like "1984," like an exaggeration. But the fact that it is feasible must make one suspicious: up to now, there are few examples of a voluntary renunciation of technical achievements. Naturally, the police would be helped in their work if they had centrally stored almost all the fingerprints of adult citizens, through their search systems NADIS or INPOL, PIOS and the planned uniform data and information system. According to the description of the central state address registers, they are already of obvious help in searches.

From the constitutional point of view, there appears to be another attitude toward the registration law. Paragraph 13 of Section 1 of the bill gives the federal government the right to determine the data, their receiver, and the method of transmission. Section 2 empowers the Minister of the Interior to regulate the exchange of data between states. If you add to this the fact that in the registration law, the central office is also allowed to store such data, which previously only passed through it, then the "federal data bank" is complete -- not centrally installed, but nevertheless uniform. It is not created by the federal government, but by the states for the federal government. It does not bother the computer that the office storing the data is not located in Bonn alone, but is divided up between Kiel, Hamburg, Mainz, and Stuttgart.

Such a "divided federal data bank" would run counter to any reasonable data protection system. This is to be considered in the debate that will begin again in autumn, according to Schoeler's estimate. Then, it is also a good idea to examine critically the argument that in the preparation of data, the government is rendering the citizen a "service" -- helping, for example, a divorced woman to track down her vanished husband, and to get support payments for their dependent child. Indeed, the ever-growing welfare society is making greater and greater demands for service; its need for information with respect to the individual is also growing -- but is the government required to ratify this development?

Nevertheless, the baby should not be thrown out with the bath water. Data banks do have definite advantages, for example in the field of medicine. Sweden has made very good experiments with a central disease data file. Accident victims could be treated better and more quickly, because all the relevant data -- from blood type to allergies to previous treatments -- were on hand in minutes. No one will deny that it would be advantageous to have a central data file of all organ donors and those who are waiting for an organ transplant. But no one should close his eyes to the fact that every advantage comes with the disadvantage of possible misuse.

Everything points to the likelihood that the "computerization" of society will go still further. The belief in the necessity of EDV does not yet tolerate the concomitant realization that "there is careful, calculated ignorance of the constitutional provision for privacy" (according to Spiros Simitis, the Hessian data protection officer). And where belief is shaken, the determining viewpoint maybe that now more than ever, knowledge is power. So long as the politicians shrink from their duty of adopting a socially responsible distribution of information, we are heading for the "data dictatorship," of which

Wilhelm Steinmueller, Regensburg law professor and harsh critic of the data protection practiced in the FRG, says: "The data dictatorship will be a mild dictatorship, under which everyone has a clear conscience."

In any case, we still have a long way to go in order to realize the hope that has already been expressed, that data protection will be the "Magna Carta of the modern citizen," and proclaim the "renaissance of rights of freedom."

So what is to be done? Even today, our society is no longer viable without the computer. It is necessary to check its demands (that is, the demands of those who make use of the computer). Hans-Peter Bull has proposed a basic right to data protection that may strengthen the legal demand for "protection from the data." Moreover, still more can be done in five areas:

1. The right of the individual to information from private industry, and of the worker to information from management, must be increased. In overseeing this, care must be taken that the costs incurred and charged to the inquirer do not have a prohibitive effect.
2. The government must decentralize its data files, so that their contents cannot be combined without supervision. The central data collection must be included in the law and drastically limited.
3. In the future supplementary law on government liability, the executive branch must make compensation if it has collected false data or transmitted unauthorized data to the detriment of a citizen.
4. The flow of data within an agency, between agencies ("official cooperation"), and from the agencies to the outside must be regulated by law or legal decree.
5. The citizen must learn to give away his data as carefully and parsimoniously as his hard-earned pennies. Mistrust of all kinds of collections and interrogations is recommended.

According to past experience, it is foolish to trust to the awakening of a data consciousness.

8429

CSO: 5500

END